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I.—THE CONSCIOUSNESS OF EXTERNAL REALITY.

By Richard Hodgson.

The common man is staggered when I tell him that the shimmering transparency of green wrought by the shafts of sunlight in yonder bosky oak is in my consciousness; his surprise increases when I tell him that the tree and the weaving rays and the sun itself are in my consciousness, and when he thus discovers that my madness is not even tempered with the inconsistency of regarding vibrations as more external than colour. But when I tell him that the meaning I attribute to *consciousness* is very different from that which he attributes, that of course the leafy oak and the light-rays are external to my organism, and that something other than I produces these phenomena in my consciousness, he begins to look as if he thought I might be right, and that if he were to read a little Psychology he would no doubt be able to understand and probably agree with me. Descartes never settled his own grim question—Is the external world a dream? Truly the world of space is a dream, if by 'dream' is meant 'within the limits of my consciousness'. Descartes answered—No; but his

appeal was to the Creator, and would be of just as much worth for proving that the phantasms of our sleepful hours have the flesh-and-blood reality we experience in our waking-days. If the Creator allows us to wander deceived amid the terrors and joys of an acknowledged midnight dreamland, why not allow us also to be involved in another more enduring dreamland of the daytime? What then do we mean by External Reality? It is one aspect of this question which I propose here to consider. Part of the reply will be suggested by the following general statement of my position.

I believe that I am an individual conscious human being, that a Cosmos exists of which I form a part—that there are ordered objects besides myself, individual conscious beings, human and other, as well as beings showing no sign of life. I am neither nothing nor everything: I exist, I am not the Cosmos; I am a conscious being, I am not God. Thus I believe in the existence of beings other than myself; in short, and without equivocation, I am conscious of what is other than my consciousness. This belief is in my consciousness; all the terms of it consist of states of my consciousness. Series of sequences and co-existences presented and represented in my consciousness, I can investigate; that other imagined series of sequences and co-existences may in the future find a surpassing fruition in presentation, I can well conceive; but that I can ever discover how the Cosmos is constituted apart from my consciousness, or even how in very truth any fragment of it becomes in some way known by me,—is a proposition which it is quite as difficult for me to entertain as to destroy the nature of my intelligence. Everything presented (or represented) to me is an event or phenomenon. I call these phenomena, collectively, consciousness; individually, states of consciousness or feelings. The first great division of feelings is that into *primary* feelings and *relational* feelings. This division is essentially one of quality. The second great division is that into *physical* feelings, *mental* feelings, and what for the present I call *Ego*-feelings. This division is essentially one of degree of remoteness from myself. The *Ego*-feelings are Will, Pleasure and Pain,—and relational feelings between these. Some would divide my consciousness broadly into two worlds, the world of physical events and the world of mental events; the latter consisting for the most part of representations (direct copies or supposed analogues) of portions of the former, but containing other feelings as well. Such a merely two-fold division appears to me to be faulty. This mental world itself contains two portions which are more disparate than the commonly con-

trasted mental and physical worlds. My consciousness is clearly divisible in my present stage of evolution, into *three* worlds,—physical microcosm, mental microcosm, and *Ego*-world; the first of these being equivalent to the universe of the ordinary man, the two latter together forming what the ordinary man would call my mind. The *Ego*-world consists of the *Ego*-feelings alone. These three worlds lie on different planes as revealed in the analysis of consciousness, and there is as little excuse for confounding the third with the second as there is for confounding the second with the first. I do not say that, because these worlds are distinct enough to be different, they are therefore separable. On the contrary, I hold that they were at one stage of my evolution—using the word 'stage' reflectively—entirely indistinguishable; that they have undergone a slow differentiation; that at present it is impossible for me to be conscious of the first (physical microcosm) without the second and third, and impossible to be conscious of the second without the third, or third without the second, though I can expel the first. In ordinary waking life these three worlds are interrelated and interdependent. But connexion does not involve identity of rank, and one great bane of recent psychology is the treatment of consciousness too much as a level field or a lifeless clod, too little as a rising hill or a growing tree. What justification then can I urge for speaking of my consciousness of what is other than my consciousness?

I find certain regularities among the events of my consciousness—laws of sequence, laws of co-existence; and these regularities I express by means of propositions which vary considerably from one another as regards the cohesion between their terms. The cohesion between the terms of some propositions is indissoluble. These propositions are my fundamental beliefs. Between the terms of some other propositions there is a cohesion which, though not indissoluble, is yet greater than that between the terms of their contradictories. Such propositions are also my beliefs, though such beliefs are not fundamental. In other words: for reflection, belief or disbelief in a proposition expresses the result of the mental process which consists in testing the amount of cohesion between the terms of that proposition. Belief in the proposition is the feeling of stronger cohesion between its terms than between the terms of its contradictory. Disbelief in the proposition is the feeling of less cohesion between its terms than between the terms of its contradictory. The highest warrant that can be offered for the truth of a proposition is that in this deliberate process of

testing, the cohesion between its terms remains indissoluble. Examining, then, the propositions that occur in my consciousness, I separate the fundamental from the non-fundamental beliefs, and among the former I find the belief that a world exists other than my consciousness. The question whether this world is in its nature consciousness need not now detain us. So far as I am concerned, I may call it *extra-conscious*. It is independent of my consciousness, though not in the sense that it is unrelated to my consciousness. It is the existence of this extra-conscious world which I imply when I say I am conscious of an external reality. In looking, *e.g.*, at the book before my eyes, I am immediately conscious of an external reality in the sense explained above. I find it utterly impossible, in becoming conscious of this form, colour, position in space, &c., to keep from arising also the consciousness of a world other than my consciousness. But the special difficulty I wish to attack in this paper is the *germ* of the consciousness of External Reality. This germ we may refer to as the consciousness of a *Non-Ego*.

Let us first revert with emphasis to the confusion, in the less developed intelligence, between the organism and the *Ego*. Contemplating the book and my organism, I can perceive their separateness—cannot possibly perceive or conceive them otherwise than as apart from each other in space; but besides the spatial externality I have the consciousness of a *Non-Ego*. Contemplating the elements of my perception (or conception)—a much more complex process—I conceive them as forming groups in the world of my consciousness; but along with them persists, ever inexpugnable, the consciousness of a *Non-Ego*. The ordinary man does not understand the nature of the distinction illustrated, and his judgment is therefore worth nothing. *Non-Ego* is for him nearly the same as non-organism. The appeal to the natural belief of the ordinary man in the existence of three-dimensional fragments of a coloured or colourless *Non-Ego*, is worse than the appeal to the natural belief of an Australian savage in the non-conservation of energy, or to the instinctive judgment of a grub that it must crawl for ever on solid greenery. I may ask a child whether two straight lines can enclose a space, and he may affirm positively that they can; but his affirmation is perhaps to be explained by the fact that he has not yet distinguished between straightness and curvature, or by the fact that he does not understand what is meant by enclosure of space: the home-region between the meeting straight lines may seem to him a space

enclosed, just as the limits of the organism may be confused with the limits of consciousness. The ordinary man's real belief is that there are coloured and extended objects existing as such apart from his organism and mainly independent of it. Beyond this primitive belief the testimony of the ordinary man's consciousness is vague and vain. In the evolution of human intelligence, as differentiation continues, two positions become definitely distinguished. On the one hand various coloured and extended objects are recognised as external to the organism, which is another coloured and extended object; while on the other hand these objects are recognised as implying existences other than the *Ego*. These two conceptions—*external to the organism, other than the Ego*—become gradually separated and distinctly shaped. The former includes conceptions of extension, colour, &c.; the latter includes the conceptions of independence, permanence, and the root-constituent of Force. But in the earlier stages of the development, while the organism and the *Ego* are yet confused, what as such would be rightly regarded as existing apart from the former (*e.g.*, colour, space-occupancy, &c.) are wrongly taken for existing as such apart from the latter. Thus the objects in the spatial world outside the organism are eventually seen not to be the External Reality, but to imply the existence of an External Reality—to have associated with them indissolubly the consciousness of a *Non-Ego*.

Why should we discern among philosophic writers such a singular reluctance to admit their consciousness of an extra-conscious something? The extra-conscious group of events which is constituted of the elements of my past life is not in my consciousness any more than is the extra-conscious reality of which I am conscious when I gaze upon the environment of my organism. I admit it may be replied that the extra-conscious world of my past life *was* in my consciousness, whereas the other extra-conscious reality never has been in my consciousness. This is true; and a somewhat similar objection might be urged were I to appeal to my consciousness of future events: "Our finest hope is finest memory". But the difficulty of the objector is not the realisation in thought of the consciousness of an extra-conscious something; his difficulty is rather the explanation of the existence of this consciousness. His reply still leaves me with the notion of something other than my present consciousness. In what does this fundamental notion of otherness consist? What is the psychological analysis of its content? Nor is this all. I fail to see how any thinker

of any school can, except by a subtle evasion, escape from the admission that he too finds this consciousness of a *Non-Ego* entwined throughout his intellectual life. One obstacle in the way of compelling this admission is the ambiguity of the word Consciousness.[1] I may give one instance of the obscurity into which this ambiguity is likely to lead us, taken from the writings of an able thinker, Mr. Shadworth Hodgson, who is by no means wanting in precision of statement. In his *Time and Space*, p. 5, Mr. Hodgson remarks: "By the term consciousness, in this Essay, is always meant consciousness as existing in an individual conscious being". On p. 21 he writes: "The current theory, I believe, is this, that existence or Being far exceeds consciousness," and after explaining and objecting to this view, as he conceives it, he proceeds to express his opinion, on p. 22, that "existence and consciousness are co-extensive, one as wide as, and not wider than, the other". Now the current theory may well be that Being far exceeds consciousness as existing in an individual conscious being, and, though Mr. Hodgson may have objections to such a theory, I doubt whether he would allow himself to plainly assert that existence is not wider than consciousness as existing in an individual conscious being, even after he had had an opportunity of discoursing upon the characteristic of "existence" as presence, actual or possible, in consciousness (as *existing* in an individual conscious being). He certainly thinks that we have "valid reasons for conceiving of ourselves and the actual world in which we live as surrounded by an *unseen*, but in its nature phenomenal, world, of which ours is the seen part, and with which it has real but unseen relations".[2] Statements like these unquestionably involve the consciousness of a *Non-Ego*. This profoundest conviction of all of us, that we are individual conscious beings in the midst of an orderly system which becomes in some way partially known to us, has not yet received its fair share of the psychological microscope.

[1] Let the reader consider what he means by consciousness in each of the following expressions:—

1. Consciousness of pain.
2. Consciousness of the pain of humanity.
3. Consciousness of this purple violet.
4. Consciousness of another human being.
5. Consciousness of existence other than my consciousness.
6. Consciousness of a world surrounding ourselves and the actual world in which we live.
7. Consciousness of the past.
8. Consciousness of the future.

[2] *Philosophy of Reflection*, i. 23.

Sundry philosophers indeed admit the existence of the weighty problem they discover themselves in the act of carrying, by attempting in one mode or another to deal with it. Sometimes they get rid of the mysterious burden by throwing the bottom of their vessel overboard, sometimes by transforming it into a drifting differentiation of the Unknowable. In this latter case, however, the burden declines to be shifted, but consents to be doubled. It arises, they would say, in my consciousness because it arises in a Universal Consciousness; my consciousness *is* the Universal Consciousness—and lo! the explanation desiderated. Surely we shall be wise to examine more closely this consciousness of a not-self before we dare to disintegrate and evaporate it so freely. Whether we believe in an unseen world beyond us, or a world of which this physical microcosm is a transfiguration; whether we take our rest in Berkeley's God, or in a Universal *Ego*, or in the Unknowable; whether we pin our faith to some "thing-in-itself," or to the existence of separate conscious beings, or only to that which has not yet fully become; we pledge ourselves beyond retrieval to the consciousness of a *Non-Ego*. There is no alternative but between the maintenance of Solipsism and the acceptance of the bald plain fact that each is conscious of what is not his consciousness.

Equipped with these preliminary considerations, let us inquire in what this peculiar consciousness consists. What are its elements? The most successful attempt hitherto made at its resolution is the masterly analysis contributed by Mr. Spencer in elucidating his doctrine of Transfigured Realism. But he has not distinguished with sufficient clearness between the analysis of the developed notion of "objective existence" and the analysis of the germ of that notion. Hence his luminous exposition fails us at the point where we are most in darkness. Nevertheless the light he has given us in other portions of his Synthetic Philosophy will enable us, if we concentrate it on the sections dealing with Transfigured Realism, to lay bare the structure of the germ before us. In the first place, then, we have to examine Transfigured Realism. I accept this doctrine of Mr. Spencer's, but I am bound to admit that there are expressions in his Synthetic Philosophy from which it might be inferred that some cruder view has occasionally usurped the place of the true doctrine. Instances of this may be found in *Principles of Psychology*, §§ 438, 439, where, above all places, we should expect consummate accuracy. Spatial externality seems to be here confused with extra-conscious ex-

ternality. Space-relations cannot themselves be rightly said to "constitute the knowledges of externality and position," if "externality" is supposed to apply to the reality beyond consciousness. Even supposing that the book of my mental microcosm, as well as the book of my physical microcosm, involves the consciousness of something not my consciousness, the state of consciousness thus involved is not in either case *constituted* of any space-relations, however closely it may cohere to them. There is without doubt, I repeat, surrounding my organism a physical world the parts of which are spatially external to one another: this world lies within the limits of my consciousness; but the primary assertion of Transfigured Realism is that a world exists other than my consciousness, which world may be described as having for its direct analogue, and only an analogue, that physical world within my consciousness with which I am familiar. Space-relations attach only to portions of the physical and mental worlds of my consciousness, and are but analogues of relations in a world other than my consciousness.

This doctrine of Mr. Spencer's has been widely and strangely misunderstood;[1] and, to avoid misconception as

[1] I may here notice some misapprehensions of Transfigured Realism shown by Dr. Edmund Montgomery in his articles contributed to MIND. I gather from some passages that he objects to phrases such as "representative relation," used for the world of consciousness in its relation to the world beyond; yet he frequently employs phrases precisely similar to this for the purpose of expressing his own doctrine, which, in its primary assertions, is in no way different from Mr. Spencer's. Dr. Montgomery speaks of powers not in consciousness and of their effects in consciousness, such effects being described as adequate mental signatures (MIND XXVI. 227, 228), and as *representing* the powers not in consciousness; yet he has apparently failed to recognise the resemblance between this view and Mr. Spencer's doctrine, to which he gives an utterly erroneous interpretation (MIND XXVII. 384). For Mr. Spencer's *Non-Ego* and its effects in consciousness Dr. Montgomery seems to have substituted a physical stimulus and the resulting organic change, both of which are thought of as in the world of my consciousness; he then distinctly implies that Transfigured Realism assumes "the properties of external existences" to be "reproduced in the organic medium through stimulation". The two elements, the nature of the correspondence between which he is discussing, are represented somewhat more obscurely in his note (p. 384); and it remains not quite certain which pair Dr. Montgomery would attribute to Mr. Spencer: (1) Changes outside the organism and changes inside the organism; (2) Stimulating powers and effects within mind; (3) World outside the organism and sensorial revelation within the organism. In any case it must be said that the representative relation of which Mr. Spencer speaks concerns what Dr. Montgomery calls the unconscious powers and the mental facts which *represent* them (MIND XXVI. 228); and I have been unable to find reasons given by Dr. Montgomery for assigning a different meaning to the word *represent* when used by himself from that

to my own views, it is needful to draw attention to the existence of slight incongruities in Mr. Spencer's presentation of it. This task is not the less needful if, as I venture to think, Mr. Spencer's verbal inaccuracies have led him unawares into the adoption of views which will prove to be erroneous. It will suffice for my purpose if I comment upon a hypothesis dealing with the relation between one special form of External Reality and its tokens in my consciousness. I consider certain changes in my physical world as existing beyond the consciousness of another conscious being—say Tom—but as connected with various changes not in my consciousness, but regarded as in Tom's consciousness. These changes regarded as in Tom's consciousness are, to give but a general psychological description, representations of changes in my consciousness, which changes I experience under certain 'conditions' for my organism, and which I believe to resemble changes in Tom's consciousness, given similar 'conditions' for Tom's organism. In this complex grouping of consciousness is, of course, involved the consciousness of a *Non-Ego*. Let us now consider the following passage from *First Principles*, p. 217 :—

"Various classes of facts thus unite to prove that the law of metamorphosis, which holds among the physical forces, holds equally between them and the mental forces. Those modes of the Unknowable which we call heat, light, chemical affinity, &c., are alike transformable into each other, and into those modes of the Unknowable which we distinguish as sensation, emotion, thought ; these, in their turns, being directly or indirectly re-transformable into the original shapes. That no idea or feeling arises, save as a result of some physical force expended in producing it, is fast becoming a commonplace of science ; and whoever duly weighs the evidence will see that nothing but an overwhelming bias in favour of a preconceived theory can explain its non-acceptance. How this metamorphosis takes place—how a force existing as motion, heat or light, can ever become a mode of consciousness—how it is possible for aerial vibrations to generate the sensation we call sound, or for the forces liberated by chemical changes in the brain to give rise to emotion—these are mysteries which it is impossible to fathom. But they are not profounder mysteries that the transformations of the physical forces into each other. They are not more completely beyond our comprehension than the natures of Mind and

which it bears when used by Mr. Spencer. Dr. Montgomery further objects to the word *transfiguration* as being misleading ; yet he does not hesitate to use the word *revelation*, and, in the same article where this mistaken criticism of Mr. Spencer's doctrine occurs, he holds that "we trust, and securely trust, the perceptual revelation as a symbolical representation most reliable to count upon," that "we have to remember how very remotely and figuratively we in truth become aware of it," and speaks of "symbolical figurations" and "the world figured in feeling" (MIND XXVII. 393-397). No reasons appear to be given for the implied superiority of the word "figuration" over "transfiguration".

Matter. They have simply the same insolubility as all other ultimate questions. We can learn nothing more than that here is one of the uniformities in the order of phenomena."

In this extract there seems to be either a verbal confusion of Transfigured Realism with the empirical view that Tom's consciousness is supposed to be located in a special part of my physical world, or a temporary adoption of the erroneous empirical view, in forgetfulness of the standpoint of Transfigured Realism. What Mr. Spencer must mean is that modes of the Unknowable beyond my consciousness may be transformable into one another, that some of these thus transformable modes may be variously manifested in my consciousness as heat, light, &c., and may also be the cause of changes in Tom's consciousness, such changes being re-transformable, directly or indirectly, into the modes of the Unknowable, of which the effects in my consciousness are heat, light, &c. What produces a feeling in Tom is some mode of the Unknowable which can be symbolised in my consciousness as Force. To ask "how a force existing as motion, heat or light, can become a mode of consciousness," is to ask either how consciousness itself arises, to which no real answer can ever be given by us, or to ask how one mode of consciousness becomes another mode, how, *e.g.*, heat becomes light. But heat is transformed into light with no greater ease than aerial vibrations are transformed into sound, if with much less ease than cerebral changes are transformed into emotion. Under certain conditions a mode of the Unknowable beyond my consciousness may produce in my consciousness the sensation of heat, under different conditions the sensation of light; but the sensation of heat is not transformed into the sensation of light. Again, something which produces in my consciousness, under one set of circumstances, *aerial vibrations*, produces in my consciousness under another set of circumstances, *sound;* but neither of these results generates the other, any more than the colour of a rose generates the scent of it; both are results generated by causes beyond my consciousness. There is no causation whatever in the physical world, only sequence and coexistence. Nor can we entertain the supposition that the physical forces of the brain are transformed into emotion. To the emotions I experience in thinking of a particular poem, I can trace no near (even) antecedent in any way resembling physical forces of the brain. Tom may perceive divers brain-changes in what he calls Hodgson's organism, but these are in Tom's consciousness, and have indubitably nothing to do with my aforesaid emotions, by way of causing them. To

put the same truth in another way, changing the persons in the case supposed: brain-changes in Tom's organism are phenomena in my consciousness, and are not expended in producing sensation in Tom's consciousness, still less in producing emotion. What must be meant by Mr. Spencer is that heat, light, aerial vibrations and "forces" generally in my consciousness, have certain sequences in my consciousness, *viz.*, brain-changes in Tom's organism, which are in some way intimately related to certain changes in Tom's consciousness. What that relation may be is said to be a mystery, but a mystery not more profound than the relation between heat and light in my consciousness, as two different effects of some varying mode of the Unknowable beyond my consciousness.

With the extract quoted from *First Principles* let us compare some passages from the *Principles of Psychology*. In the chapter on "Æstho-Physiology" (part i.) we read of "a class of facts absolutely without any perceptible or conceivable community of nature with the facts that have occupied us"; we read that "what is objectively a change in a superior nerve-centre is subjectively a feeling," and that "at the particular place in a superior nervous centre where, in some mysterious way, an objective change or nervous action causes a subjective change or feeling, there exists a quantitative equivalence between the two"; finally, we learn that "impossible as it is to get immediate proof that feeling and nervous action are the inner and outer faces of the same change, yet the hypothesis that they are so harmonises with all the observed facts". Now I do not deny that an intimate relation subsists between the nervous action which I perceive in Tom's brain, and some particular feeling which I believe to exist in Tom's consciousness. But I venture to think that Mr. Spencer, not having kept his Transfigured Realism well to the front, has made use of expressions which seem hard to reconcile, and has put forward an obscurely-stated, if not what may prove to be an untenable and erroneous, hypothesis. (1) Something is said to be subjectively a feeling and objectively a nervous action. (2) This *nervous action*—objective change—is said to cause a *feeling*—subjective change. (3) One and the same change is said to have two faces, the inner face being feeling, and the outer face nervous action. In statement (1) we can substitute 'one and the same change' for 'something'. This change, which has two faces, must, if I am not to identify it with one of its own faces, be a mode of the Unknowable beyond consciousness. Let us consider first the case where

the nervous action is in my consciousness and the feeling is in Tom's consciousness; secondly, the case where the nervous action and the feeling are both presumed to be in my consciousness.

On the first supposition, the nervous action in my consciousness cannot be the cause of the feeling in Tom's consciousness; it would be much more nearly the truth to say that the feeling in Tom's consciousness is the cause of the nervous action in my consciousness. Tom's feeling can be supposed to remain just the same whether I know anything about the nervous action of his organism or not. Neither, taking the second supposition, can the imagined nervous action in my consciousness be the cause of my feeling, which can be supposed to remain whether I know anything about the nervous action of my organism or not. Under either supposition, if the statement involved in (2) is valid, the outer face must be the cause of the inner face of the mode of the Unknowable beyond my consciousness. Surely there is at least a verbal inconsistency between Mr. Spencer's statements? But let by *nervous action* be meant that mode of the Unknowable beyond consciousness which is symbolised by nervous action in my consciousness. Can we now see our way to a reconciliation? It will then follow from (1) that the mode of the Unknowable is either a feeling or is symbolised by a feeling; in other words, that mode of the Unknowable which causes the nervous action in Tom's organism, which forms part of my consciousness, is either identical with[1] Tom's feeling or is symbolised by Tom's feeling. Now considering (2), we find that the mode of the Unknowable is said to *cause* the feeling; hence it must be *symbolised* by Tom's feeling. In other words, the nervous action in my consciousness and the feeling in Tom's consciousness are two different effects, very closely connected in time, of a mode of the Unknowable beyond both consciousnesses. Of the precise relation between these effects I am as yet ignorant. If Tom resembles myself, the effects must be similar, unless the one effect is not so directly wrought as the other. I conclude, therefore — Tom's organism being so much like mine—that a difference of directness exists, but I think it inadvisable to characterise that difference as one of *side, aspect* or *face*. Such words imply a less difference than may be actually found to exist; and, if they render a service as convenient expressions, they may render a disservice far greater than the service, by

[1] The view held by Barratt and Clifford.

acting as a block to inquiry instead of stimulating the scientist to approximate nearer in the physical realm to the changes in his consciousness which are most intimately connected with the changes in the consciousness of another. There may be such physical changes, yet unknown, which are to the changes of nerve-matter in my brain, as these brain-changes are to the retinal changes or to the first etherial undulations that leave the lamp-flame before my organism.

A criticism made by Mr. Shadworth Hodgson on this point nearly hits the mark. "Mr. Spencer," he says,[1] "takes the proximate *conditions* of subjective states (conditions *existendi)* for the objective *aspects* of those states". Strictly speaking, the nervous changes are not conditions *existendi*, but *symbols* of conditions *existendi*. That is to say, the cause, other than my consciousness, of that microcosmic event of mine which I describe as the climax of a brain-change in Tom's organism, precedes, and is neither concomitant nor identical with the correlated change in Tom's consciousness. That the nervous change (regarded simply as an alteration in the configuration of certain molecules of nerve-matter) is the nearest approach in time and space and objective feeling that I can make in my microcosm towards the occurrence of a change in Tom's consciousness, is a proposition I decline to accept. Nervous change in this sense is not the "outer face". Rather is it a mask and a protection for the "outer face," which is probably not woven even of 'bound ether'. And, contrary to the opinion expressed by Mr. Spencer, I hold that the hypothesis of such a correlation as he supposes between feeling and nervous action cannot lead to complete congruity among our experiences. I hope at another time to show, by analysis of my worlds of three degrees, that the hypothesis referred to does not harmonise with all the facts.

To the lax passages already quoted from Mr. Spencer's

[1] *Philosophy of Reflection*, i. 61. Compare ii. 78 :—"States of consciousness, as such, may be conceived as floating like an aura over, or inhering like an attribute in, the nerve-motions which condition them. Like the colour of a star, the shape of a statue, the odour of a flower, the sound of a harp, the taste of a fruit, *abstractions*, as we call them popularly, from the star, the statue, the flower, the harp, the fruit, but *really*, to us, their most essential features, constitutive of their inmost nature, their life, their soul. These are states of consciousness objectively taken, and they furnish us with an analogy for interpreting the relation of states of consciousness generally to nerve-substance and nerve-motion." States of consciousness, "objectively taken," float "like an aura". How are they conceived when *subjectively* taken, the Method of Reflection being used?

writings, let us now add the more careful statements made in *Principles of Psychology*, §§ 62, 63, p. 272. We there find that we are incapable of assimilating subjective and objective activities; we cannot unite the two "so as to conceive that reality of which they are the opposite faces," and Mr. Spencer analytically justifies these statements by showing that "the conception of an oscillating molecule [objective change] is built out of many units of feeling; and that to identify it with a nervous shock [subjective change] would be to identify a whole congeries of units with a single unit". Mr. Spencer shows, moreover, that, though "it is impossible to interpret inner existence in terms of outer existence," it is a conceivable hypothesis that outer existence may be interpreted in terms of inner existence. Any actual interpretation but the latter is indeed impossible to thought, as is frequently urged by Mr. Spencer himself.

We are thus led to the various presentations of the principle of the Relativity of Knowledge, which is but a different aspect of Transfigured Realism. Let us collate these from *First Principles* and *Principles of Psychology*, with the object of determining clearly that the External Reality is interpreted by us in terms of our own consciousness, and of investigating what states of consciousness comprise the ultimate interpretation. We shall then be able to enter upon the final introspective analysis of our consciousness of a *Non-Ego*.

In *Principles of Psychology*, pt. ii. cc. 3, 4, Mr. Spencer argues for the relativity of the two ultimate constituents in the composition of mind, *viz.*, Primary Feelings and Relational Feelings. In c. 3 he concludes that what I am conscious of as properties of matter are but states of my consciousness, which are merely symbols of something other than my consciousness, of the nature of which something I am ignorant. (This statement must not be taken to the prejudice of any speculation depending upon my belief in the existence of other consciousnesses like my own.) But the validity of this conclusion is shown to depend on the postulate that there is something beyond my consciousness. In c. 4 it is first argued that the compound relations of Co-existence, Sequence and Difference in my consciousness cannot resemble those relations beyond my consciousness of which they are the symbols; that my Space-relations certainly differ from the ontological relations qualitatively as well as quantitatively; that my compound relations of Sequence and Difference differ from the ontological relations certainly

quantitatively and probably also qualitatively; and we are afterwards "forced to the conclusion that the relations of Co-existence, of Sequence and of Difference, as we know them, do not obtain beyond consciousness". Mr. Spencer then shows that relations of Co-existence and Sequence depend ultimately upon relations of Difference and No-Difference, and proceeds to demonstrate that the relation of Difference itself is relative. The argument in this place should be compared with the concluding chapters (24, 25) of pt. vi. "Special Analysis," where (§ 374) we learn that—

"The ultimate relation is nothing more than a *change* in the state of consciousness; and we call it either a relation of unlikeness or a relation of sequence, according as we think of the *contrast* between the antecedent and consequent states, or of their *order*. Beyond thus describing each aspect of this relation in terms of the other aspect, no account can be given of it. Like every primordial experience—like the sensation of redness or that of warmth, it transcends analysis."

According to the view thus expressed, the simple relation of unlikeness and the simple relation of sequence both alike transcend analysis; they are equally ultimate. Now, supposing Mr. Spencer's argument in pt. ii. c. 4. § 93, to be valid, he has shown our relativity in respect of one aspect only of the ultimate relation: we require that our relativity should be shown of the other aspect also. I impugn now only the last argument he employs to exhibit the relativity in question. To show that a difference in kind, which is static, can be known only by means of a change, which is dynamic,—is not enough to show that the nature of a dynamic difference may not be truly given by consciousness. Adopting Mr. Spencer's standpoint, and taking an instance he uses elsewhere, let us suppose two notes of different pitch in quick succession. Here is a relation of unlikeness; it is also a relation of sequence. If we think of the contrast between the two notes, it is the former; if we think of the order of the two notes, it is the latter. Between these two notes, which we call sequent, is there anything corresponding to the relational feeling of sequence that forms the transition for us from one to the other? Can we *think* there is not? Can we restrain the relation from arising? Again, is Mr. Spencer's argument concerning the static difference valid? What exactly does his relation of difference involve? An opponent may urge that while it *is* a change, for psychological description, it may not *mean* a change; just as what *is* a state of my consciousness may *mean* something other than my consciousness; and that the comparison Mr. Spencer really makes is between a developed conception of two co-

existent colours, and the first step of the process through which we must pass before such a conception can be reached. Let us recall a passage from the chapter on "The Relations of Co-existence and Non-Co-existence" (§ 368):—

"How can the no-changes outside be symbolised by the changes inside? That changes in the *Non-Ego* may be expressed by changes in the *Ego*, is comprehensible enough; but how is it possible for objective rest to be signified by subjective motion? Evidently there is only one possibility. A consciousness ever in a state of change, can represent to itself a no-change only by an inversion of one of its changes—by a duplication of consciousness equivalent to an arrest—by a regress which undergoes a previous progress—by two changes which exactly neutralise each other."

But the objective rest and the no-changes are, for psychological description, just as much changes as the other changes with which they are compared. Hence there is an important qualification which must not be omitted from the above chapters on Relativity, and which enables us to harmonise passages that without it would appear incongruous. In the chapter on "The Perception of Resistance" we analyse as far as "the primordial, the universal, the ever-present constituent of consciousness," *viz.*, the impression of resistance, and we learn (§ 349) that—

"Resistance, as disclosed by opposition to our own energies, is the only species of external activity which we are obliged to think of as subjectively and objectively the same. *We are disabled from conceiving mechanical force in itself under a form different from mechanical force as ordinarily presented to consciousness.*" . . . "Though the proposition that objective force differs in nature from force as we know it subjectively, is verbally intelligible: and though the supposition that the two are alike commits us to absurdities that cannot be entertained: yet to frame a conception of force in the *Non-Ego* different from the conception we have of force in the *Ego* is utterly beyond our power."

In reading pt. ii. c. 3, on "The Relativity of Feelings," then, it must not be forgotten that the something beyond consciousness which has Primary Feeling for its effect, is necessarily symbolised by the root-element of Force. Similarly, in reading c. 4, on "The Relativity of Relations," it must not be forgotten that the nexus beyond consciousness which has Relational Feeling for its effect, is necessarily symbolised by change, in its two aspects of Unlikeness and Sequence. Therefore when Mr. Spencer writes: "There is some ontological order whence arises the phenomenal order we know as Space; there is some ontological order whence arises the phenomenal order we know as Time; and there is some ontological nexus whence arises the phenomenal relation we know as Difference,"—we must add that though the proposition that "objective" difference differs in nature from

difference as I know it "subjectively" is verbally intelligible; and although the supposition that the two are alike commits me to absurdities that cannot be entertained; yet to frame a conception of difference beyond my consciousness, different from the conception I have of difference in my consciousness, is utterly beyond my power. Play with our symbols as we please, we cannot escape some ultimate Relational Feeling any more than we can escape some ultimate Primary Feeling. Primary Feeling is the substance of thought; Relational Feeling is the form of thought; and when we have reduced all substances to one substance, all forms to one form, we can get no farther. All other substances and forms having been interpreted in terms of these, it is plainly impossible to interpret these in terms of anything else. The ultimate substance and the ultimate form are alike necessarily relative, and are alike relatively necessary.

The doctrine of Transfigured Realism is one towards which Reid partially struggled, which Brown fully attained, and which Hamilton succeeded, sometimes in expressing, sometimes in darkening, and finally in getting forgotten. But while I regret and reject Hamilton's obscurities, my own conviction as to the view he attempted, however ineffectually, to announce, resembles that of Professor Veitch;[1] the view is a dim and stunted form of Transfigured Realism (though Prof. Veitch makes no mention of this title), and Brown's philosophy, Hamilton's animadversions notwithstanding,

[1] *Hamilton* ("Philosophical Classics"), c. 5. It is unfortunate that in his defence of Hamilton Prof. Veitch has carried his anxiety so far that he altogether misconstrues Brown's doctrine, and entirely alters the meaning of several passages which he quotes from Brown, taking occasion to remark that "Mill ventures on the dogmatic assertion that Brown's doctrine of Perception was not even one of mediate perception," and that a more inaccurate view than Mill gives of Brown's doctrine could not be given. In defence of Mill's correct version, and of Brown's principles, which are substantially the same as Mr. Spencer's, and which are so succinctly expressed in that monument of loving labour, *The Philosophy of the Human Mind*, I must point out an instance of carelessness on the part of Prof. Veitch which will serve to render his criticisms of Brown invalid. Other instances might be given were it needful. In support of his assertion that Brown "expressly limits knowledge or consciousness in Perception to a mere state of the mind," Prof. Veitch appeals to two passages, one of which he misapprehends and the other of which he quotes as follows: "What I *learn by* perception of the colour, or softness, or shape, or fragrance, or taste of a peach, is a certain state of my own mind," &c. But Brown's words are: "What I *term my* perception of the colour, or softness, or shape, or fragrance, or taste of a peach, is a certain state of my own mind," &c. The reader may discover Brown's doctrine in *Lect.* viii., p. 53; xxv., p. 160; xxvi., p. 167; xxvii., p. 168.

rests upon a perfectly clear if undeveloped form of the same doctrine. Brown and Mr. Spencer agree in holding that the belief in an external reality is irresistible, and that each can know External Reality only in terms of consciousness. They also agree in offering an explanation of the circumstances under which the belief arises. We shall first comment upon Mr. Spencer's account, which is given in two forms, one in *First Principles* (pt. ii. c. 2, "The Data of Philosophy"), the other in *Principles of Psychology*, pt. vii. (closing chapters of "General Analysis"). Mr. Spencer is not there proving the existence of a real world beyond consciousness; his account is not a process of reasoning by which an external reality is logically elaborated by a reflecting self out of a series of states of consciousness. What he attempts to show is that if the procedure of consciousness, before conscious reasoning began, resembled its present procedure, certain states of consciousness which must have been given would lead to the establishment of other states of consciousness; and that these other states of consciousness must have gradually consolidated into the developed notion we possess of "objective existence". Obviously, by series of alternative necessities, when asked how the consciousness of "objective existence" can arise, the answer may be either that its origin cannot be explained or that it can. If an explanation is offered, the development will be shown to have taken place either in or not in accordance with processes of consciousness like those now in operation. If not in such accordance, reasons must be given for holding that the different processes necessary for the required consciousness existed. If it be shown that processes like those normal ones at present existing would suffice to "generate" this consciousness, the only seeming answer is twofold, *viz.*, that when this consciousness is supposed to have appeared, the processes were different, and also were not competent for its "genesis"; and what are the grounds for this position? Evidently an explanation is not unsatisfactory because of positing such processes of consciousness as are now in operation; it would be unsatisfactory to posit otherwise. There are two questions to be distinguished in considering Mr. Spencer's account: What are the elements which constitute this consolidated conception of objective existence? How is it that this conception coheres indissolubly with vivid states of consciousness? Now, if the existence of any of the elements be denied, no synthesis of them will be accepted. If the initial cohesions according to the normal working of consciousness be denied, no absolute cohesion can be shown to result.

Again, if the existence of these elements be admitted and also the strengthening of their cohesions into indissolubility, no more is demanded. But if at any stage of the inquiry a halt be made, and the question asked what any one of these states of consciousness may symbolise, and what reason we have for accepting such symbolism—if, *e.g.*, it should be asked why should I accept that a certain primary or relational feeling constitutes the consciousness of something which is not my consciousness, two answers may be given. One answer is, that any denying of it must itself depend upon a precisely similar interpretation of other states of consciousness, *i.e.*, the acceptance of *their* symbolisms, and so *ad infinitum:* the objection is annihilated by its own existence. The other answer is, that the question results from a confusion between the meaning of a state of consciousness, and the psychological description of that state in subsequent analysis.

Mr. Spencer's argument is much too long for me to summarise here. I shall content myself with quoting sundry phrases which are of the utmost importance to us in our present search :—

"After that antecedent in the faint aggregate which I call the resolve to do this." "Feelings of muscular tension." "Nascent thoughts of some energy akin to that which I used myself." "So that to every motion in the vivid aggregate which has not for its antecedent a muscular tension excited by an emotion in me, there irresistibly coheres a nascent consciousness of an antecedent which takes the vague form of some such tension—is symbolised by the sense of effort,"—"the power which the faint aggregate perpetually evolves within itself." "The consciousness of something which resists comes to be the general symbol for that independent existence implied by the vivid aggregate,"—"a nascent consciousness of force, akin to the force evolved by the principle of continuity in the *Ego*."

The central point of Mr. Spencer's argument depends upon his *idea of power other than his own,* which is contrasted with *his own sense of power.* This idea of power forms the correlative of the feeling of resistance. Let us briefly compare this view with that of Brown, from whose theory Mr. Spencer's may be said to have evolved. Perhaps both theories may be considered right as far as they go; but neither goes far enough; and their places of stoppage are not very different. The failure in both appears to me to result from a defective analysis of consciousness, the two philosophers having gone astray at the same critical point. Brown's view is seen in the following passage :—

"The infant stretches out his arm for the first time, by that volition, without a known object, which is either a mere instinct, or very near akin to one. This motion is accompanied with a certain feeling—he repeats the

volition which moves his arm fifty or one thousand times, and the same progress of feeling takes place during the muscular action. In this repeated progress he feels the truth of that intuitive proposition which, in the whole course of the life that awaits him, is to be the source of all his expectations, and the guide of all his actions—the simple proposition, that what has been as an antecedent will be followed by what has been as a consequent. At length he stretches out his arm again, and, instead of the accustomed progression, there arises, in the resistance of some object opposed to him, a feeling of a very different kind, which, if he persevere in his voluntary effort, increases gradually to severe pain, before he has half completed the usual progress. There is a difference, therefore, which we may, without any absurdity, suppose to astonish the little reasoner; for the expectation of similar consequents from similar antecedents is observable even in his earliest actions, and is probably the result of an original law of mind, as universal as that which renders certain sensations of sight and sound the immediate result of certain affections of our eye or ear. To any being who is thus impressed with belief of similarities of sequence, a different consequent necessarily implies a difference of the antecedent. In the case at present supposed, however, the infant, who as yet knows nothing but himself, is conscious of no previous difference; and the feeling of resistance seems to him, therefore, something unknown, which has its cause in something that is not himself." . . . "In the view which I take of the subject, accordingly, I do not conceive that it is by any peculiar intuition we are led to believe in the existence of things without. I consider this belief as the effect of that more general intuition by which we consider a new consequent, in any series of accustomed events, as the sign of a new antecedent, and of that equally general principle of association, by which feelings that have frequently coexisted flow together and constitute afterwards one complex whole."

Brown here very nearly stumbled on the truth that Cause demands Will; but Will attains no prominence in his system; I might almost say, has no place at all. Mr. Spencer has gone further than this, but the view which he seems to have been once or twice on the point of adopting, he has not adopted. In his Essay (1860), "Bain on the Emotions and the Will," he remarks: "Leaving out of view the Will, which is a simple homogeneous mental state, forming the link between feeling and action, and not admitting of sub-divisions, our states of consciousness fall into two great classes—COGNITIONS and FEELINGS". In *Principles of Psychology*, pt. iv. c. 2, "The Will," we read: "This passing of an ideal motor change into a real one, we distinguish as Will"; also—hardly consistent with the foregoing—that Will is "nothing but the general name given to the special feeling that gains supremacy and determines action"; and in *Principles of Psychology*, pt. vi. c. 17, § 351, we find the following pregnant but neglected passage:—

"Respecting the perception of resistance, that is of muscular tension, it has still to be pointed out that it consists in the establishment of a relation between the muscular sensation itself and that state of consciousness which

we call *will*—a relation such that the unbalanced surplus of feeling of whatever kind, which for the moment constitutes the will, is the antecedent of the muscular sensation, and coexists with it while it lasts."

If we now look back to the phrases quoted from Mr. Spencer's account of the evolution of our notion of objective existence, we find that he speaks not only of the antecedent *emotion* in the faint aggregate, but of the antecedent *resolve*. We find too that the general symbol for the independent existence implied by the vivid aggregate is the consciousness of something that *resists*—or a nascent consciousness of *force*. Wherefore it is plain that in the background of Mr. Spencer's account lies inexpugnably this feeling that we call Will, whatever it may be.

Again, since Force depends upon Resistance and Resistance upon Will, and since the consciousness of the Persistence of Force is one form of the consciousness of the Unknowable, our consciousness of the Unknowable must be declared as exhibiting Will. Further, I cannot recognise my consciousness of a Non-Relative in the form which Mr. Spencer has given to it. He urges, in the chapter on "The Relativity of all Knowledge" *(First Principles)*, that we have an indefinite consciousness of the Non-Relative. He denies that to this indefinite consciousness we can give any qualitative or quantitative expression whatever (p. 91); it is likened to or identified with the formless nascent consciousness of a Cause (p. 93); it is the consciousness of an actuality lying behind appearances (p. 97), the obverse of our self-consciousness (p. 96), and that undifferentiated substance of consciousness which is conditioned anew in every thought (p. 96). The way in which we get this consciousness of reality is obscurely stated on pp. 95, 96; in fact the descriptions there given are confused, and irreconcilable with his later account of the distinction between the consciousness of self and the consciousness of not-self, and of the process of their differentiation. Mr. Spencer's inability to analyse the consciousness in question, when he wrote these contradictory passages in *First Principles*, must be set off by his analysis of the conception of objective existence in the *Principles of Psychology*. If the later account is valid, the statements in *First Principles* concerning the indefiniteness of the consciousness of the Non-Relative must be invalid. In the consciousness of the Non-Relative, of the Persistence of Force, of the Unknowable, of External Reality,—the ultimate feeling is Will. Will is therefore the foundation of Mr. Spencer's Philosophy.

What then is the position of Will in the realm of

consciousness? Is Will possible without muscular tension? Is muscular tension merely one manifestation of Will on a lower plane than Will? These questions demand a full vindication of the views expressed at the outset of this article, but for the present I merely remind the reader of my dissent from the view held by Mr. Spencer,—and, I may add, of my dissent equally from the view put forward by Mr. Mercier (MIND XXXVI., pp. 519-522), professedly in lieu of Mr. Spencer's. Mr. Mercier distinguishes between the feeling that accompanies the incipient stage of an act and the feeling of muscular movement; to the former he gives the name Will. He regards the idea of the movement as in some cases "precisely similar, save only that it is of inferior intensity or vividness," to Will. When the idea of a movement reaches a certain intensity, and is associated with action, that idea of a movement is called Will. The initiatory stage of an act may occur and no movements follow; yet the feeling appropriate to that first stage will also occur, "since the nerve-centre discharges with the requisite energy"; *i.e.*, Will may exist without the feeling of muscular movement. Moreover, Will lasts during "the passage of the nerve-current from the highest nerve-regions to the muscles". Now I am still in doubt as to Mr. Mercier's real view. I understand that there must be something more than the mere idea—however intense—of the movement, in order to constitute Will. What is the additional element? Is it, "on the physiological side," the discharge of energy requisite for the production of muscular movement, whether muscular movement ensues or not? In any case it seems, according to Mr. Mercier, that Will consists chiefly in an idea of the movement. But this is absolutely impossible if, as he also maintains, Will is a Primary Feeling and not a Relational Feeling: if Will consists chiefly in an idea of a movement, it must consist chiefly in a feeling of relation. In fact, there lingers the same obscurity in Mr. Mercier's account as in Mr. Spencer's. Mr. Spencer, we saw, speaks of Will as the "passing of an ideal motor change into a real one," and as "the general name given to the special feeling that gains supremacy and determines action". Is Will the "ideal motor change" or the "passing"? As Will is described by Mr. Mercier, it is a complex state of consciousness: in my opinion it is simple. The following four states of consciousness are quite different from one another: (1) Idea of movement, (2) Will, (3) Feeling of discharge of energy, (4) Feeling of muscular movement. Mr. Mercier holds that Will begins with a

particular nervous process and corresponds with it; I do not find that Will has its counterpart in nervous process at all, though it may have a counterpart in some subtler physical process in intimate association with the nervous process. Mr. Mercier has attempted to explain one peculiarity of Will by his assumption that the nervous process underlying Will is the resultant "of the activities of *all* the highest nerve-regions". But why should either an idea of a movement or the discharge of energy in specific nerve-channels be described as so extensive? The feeling of anger, to which he refers, is just as much such a resultant. Unquestionably it is a fact that Will is regarded as the special expression of the *Ego;* but for the existence of the supposed physiological counterpart which Mr. Mercier offers of this fact, I can find no warrant alleged. Analogous objections might be urged against Schopenhauer, who, notwithstanding his great glimpse into the foundations of philosophy, committed a grievous failure of psychological insight when he identified every act of Will with a movement of the body. In my view, Will lies on a different plane of consciousness altogether from those other feelings with which it is commonly confused.

There remains the task of completing our analysis of the bare consciousness of a *Non-Ego*, now that we have reached the conclusion that Will is the primary feeling involved. We shall not first ask what account can be given of this consciousness according to which it will, as a state of consciousness, claim no improper superiority, but fall into an already allotted place in the evolution of mind. It may possibly appear to some that the inquiry if stated in this form precludes to a certain extent an impartial investigation; although to others, on the contrary, it may seem that only when the question is thus treated are we likely to obtain a satisfactory answer. Let us then, without foreclosure of any sort, make the question essentially one of direct introspection. But here another warning must be given. It is a great mistake to suppose that what we describe in its present fully differentiated state always existed so either for us or in reality, *i.e.*, in our consciousness and recognised as there, or in our consciousness albeit unrecognised. The process of thought, in my view, is an evolution, and analogous therefore to the gradual development of the complex grossly-material universe from a nebulous mass or an atom-tornado, of the organism from a relatively homogeneous protoplasm. And the process still continues. It is not by addition of already

formed and clearly distinguished parts that thought grows; it is by the slow differentiation of a single vague thing into many definite things. Further, when we *analyse*, we analyse for reflection only, not for the real state of consciousness of which we offer an analysis. The meaning of the analysis is—that before I could have the integrated state of consciousness which I am erroneously supposed to *analyse* (in the strict sense of the word), I must have had certain experiences which, different as they appear in my quasi-analysis, I now class and label easily enough, but which never previously were really distinct so far as concerns their relation to the "complex" state. For the present reflecting *me*, certain states of consciousness are both separate and recognised as separate; but for the past experiencing *me* these states of consciousness were, in the first stage, neither recognised as separate nor actually separate, and, in the second stage, were actually separate but not recognised as separate. What some would call their compound is rather to be called their result, as Brown long ago pointed out. Nay, the word result is too strong, as Brown himself would admit; we should say—invariable immediate conjoined event. The third state so often termed a compound of two others is a different thing from either alone or both together. No step in Evolution can be *accounted for* by any preceding step. No antecedent can account for any consequent which is higher than itself. No complex can be accounted for by any simple or series of simples. These truths appear to me to be axiomatic. All I can say is that the Unknowable has built up my worlds, and such and such are the successive stages of the building. Every stage in synthesis is a new manifestation of the Unknowable; it is not caused by the preceding stages, but is caused by a continuation of whatever caused the preceding stages. From this position my consciousness of a *Non-Ego*, like every other state of consciousness, must be deemed unique and simple; but from the standpoint of psychological description, it must be said to have had its antecedents in my experience, it shows the complexity explained above, and may be analysed and classified in reflection.

How then shall we draw and colour this consciousness of a *Non-Ego?* Is it a Primary Feeling or a Relational Feeling? And to which of our three worlds does it belong? It needs but a glance to assure us that the feeling must be Relational, and that it forms part of our *Ego*-world. I maintain that in contemplating this pen I am conscious of a *Non-Ego*. With my perception of the body as presenting dynamical, statico-

dynamical, and statical attributes, coheres the consciousness of a *Non-Ego;* it is the consciousness of a Will not mine. Some relation to my own Will is involved. One of the term-feelings is a vivid state of Will. There is a feeling of relation between this and some other term-feeling; this other term-feeling is a faint state of Will. The bare consciousness of a *Non-Ego*, which forms the germ of the consciousness of External Reality, is a Relational Feeling of Unlikeness between a vivid state of Will and a faint state of Will. On the other hand the bare consciousness of the *Ego* is a Relational Feeling of Unlikeness between a faint state of Will and a vivid state of Will. It may here be objected that although we have a vivid state of Will and a faint state of Will, and what is sometimes described as a shock of transition from one to the other, we are no nearer than before to the consciousness of a *Non-Ego*. This is quite true; we are farther away; we were never so far away before; we have now reached a position whence we can *see* this consciousness, whereas previously we could but *feel* it. It is the feeling of the relation between a vivid state of Will and a faint state of Will that constitutes the bare consciousness of a *Non-Ego;* the classification of that feeling of relation with feelings of relation in general does not constitute the consciousness of a *Non-Ego*. We cannot keep our cake and eat it. Nor does either Primary Feeling of itself constitute the consciousness we are analysing. Suppose I have a simple Relational Feeling of Sequence followed by another simple Relational Feeling of Sequence. These relational feelings may be such that my feeling of relation between them is what I call a Relational Feeling of Co-existence. Neither of the relational term-feelings alone is the feeling of Co-existence; nor is the feeling of Co-existence constituted by the mere occurrence of both, though both are necessary for its constitution. Similarly in the case before us. Neither a vivid nor a faint state of Will alone is enough to constitute the consciousness of a *Non-Ego;* the two together avail not a whit better; but the Relational Feeling between the two suffices. It may be well to add, for the purpose of reconciling those who hold that we are conscious of *Ego* and *Non-Ego* in the same moment of intuition, that there is established in my consciousness a feeling of relation between the two relational feelings constituting the consciousnesses of *Non-Ego* and *Ego*. This might be anticipated from whichever side these consciousnesses are regarded. Not only might we expect that if they perpetually alternate in the normal waking life, there must eventually be established

a consciousness of the co-existence of *Ego* and *Non-Ego;* but the original Relational Feeling of Unlikeness is in one of its aspects a Relational Feeling of Sequence, and the continual recurrence of the similar and opposite simple relational feelings of sequence which in their other aspect constitute the consciousnesses of *Non-Ego* and *Ego* must itself lead to the establishment of the Relational Feeling of the Co-existence of *Ego* and *Non-Ego*.

No exact account of the origin of this Relational Feeling we have been tracing can be given. From our present point of view it may be said that following a first vivid feeling of Will comes a first feeling of sensation, which is followed by a faint feeling of Will, whereupon arises a relational feeling between the two Wills, and that here is the birth of our consciousness of a *Non-Ego*. But the actual beginning of experience is too vague for us to realise now in our highly differentiated conscious life, and any statements we might make concerning it can be looked upon as but the merest adumbrations of the process through which we have passed; Will and feeling of sensation in the earliest stages of experience cannot have had that separateness which they now display in the domain of introspective contemplation.

II.—THE SCIENTIFIC CONCEPTION OF THE MEASUREMENT OF TIME.[1]

By E. Hawksley Rhodes.

That Time is possessed of quantity or magnitude, and therefore is in some sense measurable, may be said to form part of the common conception of it. Exact science assumes that time can be measured as accurately as space can; predicating equality of certain intervals and inequality of others. It holds, for instance, that the oscillation of the pendulum of a good clock divides time into equal intervals, and that the movement of a weathercock, as it veers to and fro in the open air, does not. But when asked for the grounds of this predication of equality or inequality, the statements of even the best authorities on the subject are most inconclusive, confused and unsatisfactory. It is not that such authorities have the slightest difficulty in pointing out classes of events which do, and others which do not, mark time off into equal intervals. But they seem unable to bring into the clear consciousness of abstract knowledge the difference that distinguishes these two species of events. Their case is like that of a man ignorant of geometry who should have put before him a number of plane quadrilateral figures of all kinds. Aware of a certain undefinable similarity existing between some of the figures and not between others, he might succeed in picking out from the whole mass all that were parallelograms, and yet be quite unable to form for himself a clear abstract conception of the difference which distinguishes the species parallelogram from the rest of the genus quadrilateral. A prevalent error regarding our knowledge of the measurement of time is the supposition that it is derived from a prior knowledge of the presence or absence of forces, or of the uniform action of more general causes; whereas, as I shall have further occasion to remark in the course of this paper, the possibility of measuring time is a condition prior to our knowledge of the presence or absence of forces or of the uniform action of causes.

It may perhaps be objected to the subject I have chosen for consideration that the question is a purely scientific one, and

[1] Read before the Aristotelian Society on June 1.

of no interest to Philosophy. But the fundamental conceptions of Science must always have for Philosophy the deepest interest, as the investigation of their nature and origin cannot fail, in proportion to its success, to throw some light on the important, though difficult, philosophical problem of the nature and limits of knowledge in general. That the conception of the measurability of Time is a most fundamental one, not merely for so-called scientific, but, we might almost say, for all, knowledge, scarcely needs illustration. Until mankind had learnt to mark and count the divisions of time, knowledge, whether scientific or historical, was alike impossible; and, had they never acquired this art, they must have for ever remained sunk in the ignorance of barbarism, little, if at all, elevated above the beasts of the field. To understand the importance of this conception for exact science, it is only necessary to bear in mind that such science deals with the measurement of magnitudes of all kinds—heights, distances, angles, volumes, weights, densities, forces, and other quantities; that these magnitudes generally vary as time flows on; and that one of the problems of exact science is to determine the rates at which these magnitudes vary, in other words, to discover their velocities, to determine further whether these velocities are uniform or not, and, if not uniform, then to find out the rate at which these rates or velocities vary. Now the conception of *rate* presupposes the conception of a measurement of time, that is, the possibility of marking out lapses of time into equal intervals and the subdividing these equal intervals into equal subdivisions.

Measurement, it is scarcely necessary to observe, is the comparison of things in respect of their magnitude or quantity, and only such things as are conceived to have magnitude are also conceived as measurable. To measure a magnitude is to compare it with another of the same kind, with a view to determine whether the former is equal or unequal to the latter, and, if unequal, then to discover the ratio of inequality. Equality and inequality are special examples of the more general conceptions of likeness and difference, similarity and dissimilarity; equality being similarity of magnitude and inequality dissimilarity of the same. Spatial magnitude, or space conceived as limited by boundaries which we can, or possibly might, see or touch, in other words, by material boundaries, we measure in terms of itself; lengths being measured by some standard length, and so with areas, volumes, angles or any other determination of space. The variations of other kinds of quantities, degrees

of heat, densities, weights, &c., are measured through some theory or hypothesis connecting them with the variations of some kind of spatial magnitude, which we measure by reference to some spatial standard, and from which we infer the relative magnitudes of the quantities we are seeking to determine. Now the term equality, when applied to spatial magnitudes, means simply that, when superimposed, the limits or boundaries of such magnitudes do, or might, coincide. To determine the equality or inequality of two straight rods, they are placed side by side, one pair of ends being adjusted till they coincide; and then simple inspection of the position of the other pair of ends serves to decide whether they are equal or not. If the magnitudes cannot be superimposed, then we have to fall back on some indirect method of determining their relative magnitudes, some of the methods of mathematics, which is nothing but the science of the indirect measurement of magnitudes. But whatever be the method employed for determining whether two spatial magnitudes are equal or not, what is meant by their equality is that their limits do, or might, coincide, and by their inequality that the limits of the one fall, or would fall, within the limits of the other. Thus when the area of a triangle is said to be equal to the area of a square, it is meant that the parts of the triangle or of the square might be so rearranged that their boundaries would coincide.

Now, in the case of contemporaneous events there is something very analogous to the coincidence of two spatial magnitudes; for when the beginnings and endings of those events coincide, as they fill the same lapse of time, they are said to be of equal duration, whereas if the limits of the one event fall within the limits of the other, the latter is said to be of longer duration than the former. When, however, the lengths of time occupied by events which are not contemporaneous have to be compared together, a difficulty arises which does not admit of the same easy solution as the difficulty of comparing together two spatial lengths that cannot be superimposed. To compare the lengths of two roads, both can be referred to the same material standard yard, which can be applied first to the one and then to the other road. But a standard event cannot be carried about and applied for the measurement of two other events. All events pass away with the lapses of time they occupy. Here, then, at the outset, arises a difficulty, when we seek to determine the relative lengths of events which are either not contemporaneous or only partially so.

It will conduce to a clearer understanding of the nature of this difficulty if we refer to a practical method of measuring time and to the justifications alleged in support of it. Such a method is that of measuring time by the revolution of the earth on its axis. It is said that the earth revolves with uniform velocity on its axis, and that consequently equal intervals of time are those during which the earth revolves through equal angles. But whenever a body is said to move with uniform velocity, the question at once arises, how can it be told that any velocity is uniform unless we are first in possession of the means of measuring equal intervals of time. Attempts have been made to meet this difficulty by declaring that the earth in its rotation about its axis presents us with a case of motion in which the condition of not being compelled by force to alter its speed is fulfilled, or, at any rate, very nearly so indeed. But this is to put the cart before the horse, for our only means of discovering whether there exist or do not exist forces tending to alter the rate of revolution is by observing whether that rate is uniform or not; apart from such observation we could have no certainty of the non-existence of forces tending to alter that rate. Now such observation presupposes the possibility of measuring time.

All attempts at making Newton's First Law of Motion supply a method for defining equal intervals of time involve the fallacy of reasoning in a circle, besides labouring under the defect of trying to use the more obscure and difficult conception of force to elucidate the easier and simpler conception of time-measurement. The object of Newton's First Law was simply to act as a *caveat* against two inveterate errors: namely, first, that retardation of a body's velocity was not in every case to be considered as due to the action of force, it being erroneously believed that moving bodies had a natural tendency to come to rest of their own accord; and, secondly, that the deviation of a moving body from a straight path was not in every case to be considered as due to the action of force, it being mistakenly supposed that some bodies moved in circles of their own accord. Newton's Laws of Motion, and indeed the whole science of dynamics, dealing as it does with the motions of bodies, presuppose the possibility of the measurement of time; and the attempts of the expounders of this science to represent the measurement of time as derived from, and logically subordinate to, the general laws of dynamics, explain much of the obscurity in which the first principles of this science are enveloped. This obscurity is due to the efforts that are

made to exhibit the science under a rigorously deductive form from a few highly abstract propositions, that is to say, propositions involving conceptions of a highly abstract nature, with scarcely any attempt to show from what perceptual material these highly abstract conceptions have been derived. Thus the science presents to the eye of an inquirer a most puzzling aspect. It seems to have no connexion with the world in which he finds himself, and never to have been derived therefrom. And yet, like every other branch of scientific, rational or abstract knowledge, the science of dynamics has been drawn from what first became known by sense-perception in the concrete. Its foundations rest upon observation and comparison of the phenomena of nature as disclosed to us through the senses. Its highly abstract and complex conceptions have been gradually elaborated by mankind in the course of vast ages from the perceptual material offered in the phenomena of the external world, and primitive man must have started with a less stock of material than is now possessed by the average Bushman or Hottentot. At the threshold of the science lies the conception of the measurement of time, and we must cast a glance at some of the ideas of perception, some of the concrete phenomena from which it has been derived, to understand aright the meaning of the term equality when applied to determinations of time, in other words, to *events*, and its difference from the same term when applied to determinations of space.

Time is cut into lengths for us by events, or, to speak more correctly, it is constituted for us by the succession of events. Events, considered as constituting determinations of time, and material bodies as constituting determinations of space, as, for example, distances, lines, angles, surfaces and so forth, present some remarkable similarities. To constitute the unity of an event or of a material body, either of them must be marked off from other events or bodies by discernible boundaries. Some perceptual change must mark the commencement of the event and some other its end, just as a body is circumscribed by its shape or figure. There is, too, something arbitrary in the unity of both. What for one purpose we may regard as a single body, we may for another purpose consider as made up of an aggregate of bodies, and what for one purpose we may consider as a single event, we may for a different purpose look upon as made up of a sum of events, succeeding each other within the limits of the single event. Bodies may present any degree of resemblance one to another, and so may events.

The former may be so exactly alike as to be only numerically distinguishable, and so may the latter. What can be more like each other than each swing of a clock's pendulum or each vibration of a chronometer's balance-spring? As, too, some spatial determination of one body, its length for example, can be used to measure, in other words, to compare together, the spatial determinations of other bodies, so likewise the duration of some kind of event can be used to measure or compare together the durations of other events. For it is not time that we measure, but the duration of events, just as it is not space that we measure, but its material limitations.

Again, in both departments of measuring, a similar experience of the untrustworthiness of conclusions as to relative magnitude drawn from the immediate impressions of the senses, unaided by instruments of precision, and of the impossibility of arriving at any common agreement in conclusions so derived, has compelled mankind to invent such instruments. If the apparent heights and distances of objects differ so widely in consequence of a variety of circumstances affecting the observer at the time and position from which he views them, the apparent lengths of equal lapses of time differ no less widely in consequence of the different qualities and intensities of the feelings which may have been experienced in those intervals. One month may be passed in the ordinary, peaceful routine of everyday life, and the next in the midst of the novel, vivid and exciting scenes of a great campaign. Of how vastly greater length will the latter month appear than the former. The agonies of a painful suspense will lengthen out one hour into many, and the death-like repose of a trance passed in a state only just raised above the level of consciousness will dwindle down hours into moments. The greater or less intensity of the feelings that have filled it, lengthens out or shortens the perspective of an interval of time, as we look back upon it. We see, then, how indispensable was the invention of instruments of precision and the acceptance of common standards for measuring determinations whether of space or time, if success was to attend the efforts of men to unite their scattered sense-perceptions into the unified idea of one common objective world, and to co-ordinate and synchronise the changing succession of events which have constituted the experience in time of innumerable distinct individuals into the idea of one objective self-consistent history of that world.

Now, the accidental circumstance—accidental in the sense that we can see no reason why it might not have been other-

wise—that bodies do not undergo rapid changes in their figure and magnitude has enabled us to embody in durable material a permanent record of the particular length or spatial magnitude which we wish to use as a standard for comparing together spatial magnitudes at different times and in different places. In like manner the discovery or construction of standards for the measurement of time depends upon the no less accidental circumstance that bodies have been found to repeat similar movements in uninterrupted succession, or have disclosed properties to the patient investigation of man, which have enabled him, through a skilful use of his sole executive faculty, that of altering the state of aggregation of matter, by putting the right sort and the right amount of matter into the proper relative positions, to create structures which automatically produce a continuous succession of events, each as like the other as one coin is to its fellow turned out of the same press, and not only produce them, but register the number produced. I refer, of course, to such instruments of precision as clocks and chronometers.

The oscillation of the pendulum of a clock and the vibration of the balance-spring of a chronometer are examples of events which are said to repeat themselves—recurrent events, as they are called. Such events form a very numerous and diversified class of the changes that are observed to take place in the world around us. As additional examples, we may mention the revolutions of the heavenly bodies, either on their axes or in their orbits, the recurrent phases of the moon, eclipses of the sun and moon, the ebb and flow of tides, the annual blossoming of plants or migrations of birds, the vibrations of stretched strings, the ticking of clocks, the hourly chiming of their bells, the beating of the heart, the rhythmical action of the lungs in breathing. These recurrent events may be apprehended by any of the organs of sense; for, though the examples adduced above appeal only to the organs of touch, sight and hearing, it is not difficult to imagine the recurrence of similar scents or flavours, events perceived through the organs of smell and taste. It is some similar feature or features in their perceptual contents, whatever be the organ or organs of sensation through which they are perceived, that makes us call events recurrent or say that they repeat themselves. Thus, in the series of recurrent events generally used for the measurement of time, the same bodies go through similar relative movements or are associated with the perception of a similar sound. In the case of the earth's

daily revolution on its axis, the same fixed star is observed to cross at intervals the wire placed in the focus of the object-glass of the transit-instrument which the astronomer has carefully adjusted in the plane of the meridian of his observatory. The pendulum of a clock repeats the same movement relatively to the body of the clock, and so do the hands. The clock repeats at intervals the same ticking sound or the same sound of its hour bell.

Having thus indicated the perceptual features from which has been derived the conception of that great genus of events which we have called recurrent, we must now turn our attention to the two great species comprehended under that genus, with a view to determine the difference which distinguishes the one from the other. These two species of recurrent events are the isochronous and the an-isochronous, and the fact that the events in any series of the former class are of equal duration, occupy equal lapses or periods of time, while the latter do not, would usually be considered a sufficient account of the differentia between them. But we have further to ask what is meant by this term *equal* when applied to periods of time. As I have observed before, the term *equal*, when applied to determinations of space, refers to the coincidence of their limits or boundaries, determined either by direct superposition or juxtaposition, or by that indirect kind of superposition brought about by referring them to the same standard. But neither of these methods has either meaning or applicability to events happening at different times. If I say that a certain event that occurred last year was of equal duration with another event that happened this year, because both events synchronised with the same number of diurnal revolutions of our globe, then, as I am not referring the events to one and the same diurnal revolution, it is obvious the question might be asked, How do you know that these diurnal revolutions are of equal length, or else, what do you mean by the term *equal* thus applied? Now, it may be imagined that some clue to answering this question might be found if we were to take some single series of isochronous recurrent events (for example, the annual return of the sun to a given point in the sky), and some single series of an-isochronous recurrent events (for example, the periodical earthquakes that shake the south of Italy), and compare them together: that we should then detect in the one series a something not to be found in the other, a something the presence or absence of which made us call the one isochronous and the other an-isochronous; just as, on comparing one row of upright posts fixed in level ground with a

second row fixed in like ground, and observing the tops of the former row to form an even, level line, and the tops of the latter an irregular line, we should, owing to the perceived difference in the character of these lines, call the former set of posts of equal height and the latter of unequal. But this would be a mistaken view. We could not detect any such difference in a series of isochronous events when compared with an an-isochronous series. The difference we are in search of does not disclose itself till we come to compare two or more independent series of contemporaneous isochronous events. We then discover between them a relation which does not hold good between different series of an-isochronous events, or between an isochronous and an an-isochronous series. When we have made clear the nature of this relation we shall, at the same time, have made clear the nature of the difference which distinguishes an isochronous series of recurrent events from an an-isochronous one.

Let us, then, take two independent series of contemporaneous isochronous events—a succession of revolutions of the earth on its axis, or sidereal days, and a succession of oscillations of the pendulum of a carefully-constructed astronomical clock. What relation do we find to hold between them? We find that each sidereal day contains the same multiple of pendulum-oscillations. Let us now take a third independent series of isochronous events contemporaneous with the former two series—the vibrations of the balance-wheel of a good chronometer, and we find that each sidereal day contains the same multiple of these vibrations, and, supposing we find 16 vibrations of the balance-wheel to coincide with 9 oscillations of the clock's pendulum, then, considering each successive 9 oscillations of the pendulum as a single event, each one of these events will contain the same multiple of vibrations of the chronometer's balance-wheel, namely 16. Taking, then, these three independent series of contemporaneous isochronous events, we see that each one of the successive events in any one of the series is the same numerical multiple, or measure of the contemporaneous successive events of the other two series. I have said that the separate series must each be independent of the other. That the chronometer-series is independent of the pendulum-series can easily be shown. Taking the sidereal day as the common standard of reference, I can alter the rate of vibration of the chronometer's balance-wheel without affecting the rate of oscillation of the pendulum, and *vice versâ*. An example of several series of recurrent events, in which each

series is not independent of the other series, will be found in the chain of wheels of a clock. The successive revolutions of any one wheel constitute a series of recurrent events. Furthermore, the successive revolutions of any one wheel are always the same multiple, or the same measure, of the contemporaneous successive revolutions of the other wheels. Thus the interval of time occupied by the revolution of the wheel to which the little hand of the clock is attached is always coincident with the twelve intervals during which the wheel to which the big hand is attached has performed twelve revolutions. But these series of recurrent events are not independent. For, taking either the sidereal day or the vibrations of the balance-wheel of the chronometer as the standard of reference, if I increase or diminish the rate of revolution of any one of the wheels of the clock I proportionally increase or diminish the rates of revolution of all the wheels connected with it; and thus, though the successive revolutions of one wheel may constitute, with reference to the chronometer and sidereal day, an an-isochronous series of recurrent events, the contemporaneous revolutions of the other wheels connected with it will all the same continue the same multiples or measures of the former wheel's revolutions. No *a priori* rule can be laid down which could serve as a criterion for determining whether one series of recurrent events be independent of some other series.

A series, then, of recurrent events is considered to be isochronous, in other words, to mark time off into equal intervals, not because of some particular mark found in each one of its events, and not to be found in each one of the events of an an-isochronous series, nor because of some relation discoverable between the successive events of the isochronous series only; but because each one of its events is the same multiple or measure of the contemporaneous successive events of another and independent series of recurrent events, the latter series being at the same time determined as isochronous through holding a reciprocal relation to the former. Both series taken together constitute a scale for the measurement of time with two related sets of gradations, just as a rod subdivided into feet and inches does for the measurement of spatial length. If, then, the periods of revolution of planets around their primary and on their axes, the oscillations of the pendulums of clocks, or the vibrations of the balance-wheels of chronometers, the vibrations of stretched strings uttering the same musical note, and many other series of recurrent events, are called isochronous, or considered to mark time off into equal

intervals, it is because the several series are independent each of the others, and stand in the above reciprocal relation to each other; and the nearer the approximation is to this reciprocal relation between independent series, the nearer is the approximation to equality in the intervals of time they mark off. Any two series of recurrent events between which this reciprocal relation is not found to hold are, one or both of them, an-isochronous. Or we may, if we like, express our meaning in somewhat different language. In a correlated system of two independent series of isochronous events, either of the series finds the ground of its isochronism, of the equality predicated of its individual units, in the other series, and reciprocally. If it be a correlated system of any number of such series, each several series finds the ground of its isochronism in the other series. Such correlated systems of series constitute a scale for the measurement of time, graduated into smaller and smaller subdivisions, as a straight rod subdivided into yards, feet, inches, tenths, &c., does for the measurement of spatial length.

To make our meaning still clearer, let us imagine an astronomer, on comparing the sidereal day and his clock together, to find the latter, one day, several minutes fast, another day, several minutes slow. His first conclusion would be that his clock had ceased to mark time isochronously. But suppose all other clocks and chronometers were found to show a similar irregularity when compared with the period of the earth's diurnal revolution, while, when compared with each other, they were found to maintain the same fixed proportions among the number of intervals into which they severally divided the same length of time, our astronomer would now ascribe the irregularity to the earth; he would draw the conclusion that it had ceased to revolve with uniform velocity on its axis, and would do his best to discover what could be the cause of the irregularity of motion that had so unexpectedly disclosed itself.

Nature and art, then, present to us a number of distinct and independent series of contemporaneous recurrent events, such that the longer events are always subdivided in the same proportion by the shorter, and the latter by those shorter still, and so on. Such a scheme of events constitutes a graduated scale for the division of time, just as miles, furlongs, yards, feet, inches do for spatial lengths, or degrees, minutes, seconds do for angular magnitudes; and, as two lines or two angles are equal when they both coincide with the same number of divisions of the spatial scale, so by analogy the lapses of time occupied by two non-contemporaneous

events are said to be equal when they both have coincided with an equal number of the recurrent events which constitute the temporal scale. The continuity of time, too, is analogous to that of space; for, as the process of subdividing any given line or angle can ideally be carried on without limit, so the time occupied by any given event can be conceived as capable of subdivision without limit by events of briefer and briefer duration.

The foregoing remarks serve to show what is the nature of the measurement of time and how entirely independent it is of any scientific or dynamical theory, depending, as it does, upon the direct observation and comparison of recurrent events as they pass, apart from any speculation as to the forces or causes which produce them. All scientific theories, such, for example, as dynamics, that deal with changes taking place in time, take it for granted that time can be measured. The measurement of time is prior to such theories; they are based upon it, as one of their grounds; it is not based upon them. The very possibility of such a science as dynamics depends upon the existence of a correlated system of isochronous events. Such a science did not and could not originate until such a system of events had first been discovered. These events are some of the chief phenomena on which are based the concepts and principles of that science. Without the existence of these concrete facts such conceptions as those of velocity and acceleration, and such principles as Newton's Laws of Motion, could never have been arrived at; and if such correlated series of isochronous events were to cease to exist, the science of dynamics would be incapable of application to natural events, and would be unintelligible to a new generation of men unacquainted with such a system of events. As has been said before, it is not dynamical science that enables us to decide what events mark time off into equal intervals: the possibility of marking time off into equal intervals is presupposed by that science; and this possibility rests, as we have seen, entirely on the *a posteriori* grounds of observation and experiment. Nature, for all we can see to the contrary, might never have presented to our observation, nor the device of man have been able to contrive such correlated systems of isochronous events, and then the measurement of time would have been an impossibility and the exact sciences that rest upon it would have been non-existent.

This fundamental importance for exact science of such isochronous events throws so much light on the nature of such science, and thereby on the nature and limits

of human knowledge in general, that it well deserves further illustration. Taking a so-called isochronous series, and a so-called an-isochronous series of events, let us ask ourselves this question: Why are the intervals of time occupied by each oscillation of a good clock's pendulum, to be preferred as units of time to the intervals which elapse between the successive commencement of the swings of a weathercock exposed to the winds of heaven? The number of the latter intervals can be imagined capable of registration, by means of some simple machinery, on a dial, just as well as the number of the former on the clock's dial. We certainly look upon the movements of a weathercock as it veers to and fro with every puff of wind, as the very type of capriciousness and irregularity, and yet, so long as we confine our attention to these two series of recurrent events, no ground can be discovered for preferring the one to the other. If it could be shown that the clock's unit of time possessed, while the weathercock's did not possess, that kind of equality which belongs to spatial magnitudes, that is, actual or potential coincidence of limits, this might be a ground of preference. But, as we have seen, no class of successive events can ever be shown to have this kind of equality. The ground of our preference clearly lies then in something external to either series. What this ground is has already been partially explained. The oscillations of the pendulum constitute one of those numerous series of recurrent events which stand to each other in the relation of numerical multiples or measures, a relation similar to that in which the larger and smaller sub-divisions of a straight rod used for linear measurement or of the graduated arc of a circle used for angular measurement stand to each other. This is a partial explanation of the nature of the ground of our preference. We must try and make it fuller and deeper.

Now, when we contrast the graduated arc of our circle or length of our measuring rod with a similar arc or rod divided at random, as we call it, we recognise that a rule, law, principle, uniformity, or form, has been imposed upon, or is present in, the former but not in the latter. And we recognise the presence of a similar rule, law, principle, uniformity or form in our correlated system of series of isochronous events —a law to which the oscillations of the clock's pendulum conform, but to which the movements of the weathercock no more conform than do the random subdivisions of a circular arc or straight rod. Magnitude or quantity can be made to conform to no principle or law more simple, less complex.

By it the magnitude, whether duration of event, length of rod, or any other quantity, is conceived as the sum of homogeneous units, and each of these units is conceived as composed of the same number of subordinate homogeneous units, each again of the latter being also made up of an equal number of homogeneous units subordinate to the former, and so on without assignable limit. This simple and therefore easily apprehended law has been suggested to us, as we have seen, by the concrete events and objects given us in sense-perception, by our experience of the real world. It has its conditions in that reality: had that reality been different this law might never have disclosed itself to us. It has reference to that reality, and, so far as man can act upon and alter that reality, he often makes that reality conform to this law, as may be seen in his instruments of precision used for measuring.

But let us recur again to the oscillations of the clock's pendulum and the movements of the weathercock, in order to illustrate a profounder reason than the simple law of isochronism for preferring the former instrument to the latter as a time measurer. If the system of correlated series of isochronous events we have discovered ended with itself, and were of no further application; if the simple objective law it embodies stood alone (objective, I call it, in the sense of being perceived to be present in numerous classes of concrete events), then our knowledge, our general knowledge, which is nothing but such laws, forms, uniformities, rules and principles taken with a subjective reference, would be equally limited. But this correlated system, this graduated time-scale, does not end with itself. Its importance to us lies in this, that it can be made to serve as a lamp to guide us to the discovery of other and more complex laws or uniformities regulating the ever-changing magnitudes in the world around us, as an instrument for reducing to order that apparent chaos. It is capable of constituting a permanent basis of reference with which to bring all other changes into relation; their varying magnitudes can be expressed as functions of its time-units; and the fixed relations—the equations—established between it and them, and, through it, with each other, constitute the laws, principles, rules and uniformities that make up that portion of the exact sciences which deals with changing magnitudes. If I take any time-unit from a correlated system of isochronous recurrent events, in other words, from a time-scale, as, for example, the time of vibration of the balance-spring of an accurate chronometer, then I find the spaces traversed by a falling

body can be determined by a uniform rule; whereas, if I take the interval between each swing of a weathercock as my time-unit I can discover no uniformity in the spaces traversed. The law of gravitation, that the acceleration of the attracted body is inversely as the square of its distance from the attracting body, holds for isochronous time-units, but not if the time-unit is determined by the motions of a weathercock. Taking the graduated time-scale, we arrive at the vast generalisation governing all transformations of energy. Taking the units served out to us by our weathercock, we can discover no uniformities, laws, principles or rules whatsoever; so that with reason is that instrument taken as the fitting symbol of all that is capricious and irregular.

These few instances, among an endless number, will serve to illustrate the necessity and immeasurable importance, for exact science, of a knowledge of the correlated systems of isochronous recurrent events disclosed to mankind after ages of patient observation of the intricate flux of changes for ever taking place, both in the world around and the heavens above. They serve to show that it is no matter of indifference, no matter for arbitrary assumption, what series of events should be defined as made up of equal time-units. On the contrary, if man was to extend the limits of his knowledge, it was of the utmost consequence that he should patiently observe, count and compare until he could select the right series, if he would not, by selecting the wrong series, incur the penalty of defeating the very object he had in view—I mean, the union of the manifold of phenomena under principle, law, rule or uniformity. In the course of this paper enough, I hope, has been said, not only to explain the difference between the nature of the measurement of time and space, but also to show how vastly more complicated a process the former is than the latter; how very simple a matter is the construction, preservation and application of a standard of length for the measurement of space when compared with the construction, preservation, and application of a standard of length for the measurement of time. To determine the scale for the measurement of time, and by means of it to measure time as it flies past, constitutes the most important function of the great central astronomical observatories established in all civilised countries. The accumulated records of past observations of the heavenly bodies preserved in such places, the wonderful and complicated instruments of precision required for taking such observations, and the accomplished and highly-trained body of scientific experts for the proper use of both are all neces-

sary for the successful, the exact, performance of an operation which the unreflecting mind constantly assumes to be one of the simplest—the measurement of Time.

There is one more point connected with our subject to which I must make a very brief reference. New systems of geometry have been analytically developed by mathematicians not based upon the axioms of our common or Euclidean geometry—systems dealing with spaces of more than three dimensions or with spaces of various kinds of curvation. Such kinds of space may be called transcendental, as transcending what is given us in sensuous perception. But I am not aware that it has ever been pointed out that the analogy time bears to space can be shown to extend into the region of the transcendental. And yet after what has already been said on the subject of time-measurement, it is only necessary to suggest that worlds can be imagined to exist each with its own correlated system of isochronous events constituting its own measuring scale for time, and yet that, could some superior being grasp in one view these various time-scales as they divided the same lapse of time into intervals, he might find them either irregular and lawless relatively to each other, or capable of being related to each other under laws of any degree of complexity. In the former case the unity of nature, as considered to extend throughout the universe, would be non-existent. Each separate world would have its own distinct system of physical laws, incapable of connexion with the other systems. In the latter case the unity of nature would embrace a complexity that might exceed in any imaginable degree the complexity of the only nature with which we are acquainted, with its single system of correlated series of isochronous events.

III.—THE SCIENCE OF HISTORY.

By J. Murray Macdonald.

The idea of Progress is the ruling thought of the modern world. There is no earnest thinker who is not influenced by it. It is the principle by which historians seek to systematise the facts with which they deal. It is the very backbone of science. It exercises a marked influence on practical politics. It penetrates every branch of general literature. It has even, of late years, begun to influence the thinking of theologians.

But this term "Progress," without further qualification, is a vague and misleading term, and one which has had a baleful influence on politics on the Continent, and which has been the occasion of much indecision in the conduct of affairs here in England. This arises from the fact that the term "Progress," unless strictly defined, means nothing more than change. It is without scope or goal, and has no standard by which to estimate change. The improved, more perfect state of things, towards which it professedly tends, is altogether undetermined. Is it possible to state what it is that constitutes this progressive life—what its end and aim is? Can we determine the whence and the whither of this great struggling human life whose deeds constitute what is called History? This is the question to which I shall attempt, in this paper, to give a very general answer.

I shall best pave the way for my answer by adverting briefly to the theory of life which has lately gained currency as the result of the discoveries of science. These discoveries have established the fact that this earth was at one time a molten mass, in some such state as the sun is at present; that this mass gradually cooled; that, as this process of cooling went on, life, in a perfectly simple, uniform type, showed itself; and that, from this primitive, uniform type, all higher grades of animal life have originated by a process of evolution, due to the continuous operation of purely physical causes. The attempt to account for the first form of life, on what are called physical principles, has failed. Darwin stated his belief that this primitive form was due, not to physical causes, but to the direct action of the Creator.

Given, however, the simplest form of life, he held that science could account for all subsequent, more complex grades, without recourse to the idea of the special action of the Creator. He believed also that as the earliest forms of life have disappeared, and given place to other and higher forms, so, by a similar process of modification, those species of animal and plant life now existing will, in the far-off future, have given place to new and dominant species, that man, for example, will, in some immeasurably distant period, have disappeared from the face of the earth, and have been replaced by some species possessing higher corporeal and mental endowments. The conditions which determine the progress are purely casual ones. That is to say, the succession of animals might have been different from what it actually has been; the theory maintaining that there was no definite aim, no intelligent purpose underlying and determining the process of evolution. The course which the process has followed can now be determined; but so far as can be seen, it might have followed a different one. It is, for example, conceivable, according to the hypothesis, that such an animal as man might not have been evolved from the process at all; and, consequently, that thought, or the power of interpreting the process, might not have been evolved, and that thus the process might have remained blind to its own course. And it is because the process is thus a natural, aimless one, not one urging towards a definite end and aim in which it completely realises itself, that it is maintained that it will go on in the future as it has in the past. If it were not so, if the process were a predetermined one which reached its final stage of realisation in consciousness, then man, as the absolute summit of the life-structure, would be able to determine not merely the course of life but its aim, its essential meaning. He would be not merely the product of vast natural forces which find in him only partial realisation, but he would have risen above the temporary life of the individual, who forms but a link in the great process, who receives the spark of life from his progenitors, and who passes it on to his posterity; he would have risen above that existence in time which is blind to its origin and its end, and he would live in conscious union with that Will whose purpose in the world had now reached its final stage. But according to the theory this is not so. The origin of life is unknown, its course uncertain, and its end lost in the interminable future.

If this view of life be a true one, then a Science of History, in any true sense of the term, is impossible. Mr. Herbert

Spencer indeed, though holding this view, does develop a theory of the course of human life, which, though it does not claim to be completely satisfactory, does claim to be final. In the early workings of conscious life, while mankind had amassed but a meagre knowledge of the phenomena of the world, and little or no knowledge at all of the laws that determine these phenomena, each phenomenon, as it presented itself, was not accounted for by the action of law, but was regarded as the manifestation of some power, external to the phenomenon itself, and capricious in its action. As knowledge grew, as phenomena began to group themselves in classes, these external, capricious powers gradually grew less in number, till in the Jewish and Christian religions the idea of law became so far predominant that all action was referred to one power, though that power was still a personal and capricious one, one whose relation to the world changed with the changing attitude of mankind towards it, depended, that is to say, on the conduct of men. And now, at last, the truth, towards which mankind has throughout the ages been slowly advancing, is fully recognised, and man's highest duty is declared to be the recognition of universal and immutable laws, and the regulation of human life in accordance with them. It is hardly necessary to say that, according to the theory, the laws which regulate human life in society and the state have always been determined by the interpretation given to natural phenomena,—that caprice and brute force have given place to law and justice contemporaneously with the elimination of caprice as the controlling power in nature.

On the presuppositions of this theory, I shall have something to say at a later stage of the discussion. In the meantime, what I desire to point out is, that Mr. Spencer's theory of life gains a ready acceptance because it is an easy and, at first sight, satisfactory explanation of that process of renunciation of the mere individual, capricious will, which is the necessary presupposition of action in social life, and does in reality constitute progress in history. But this process of renunciation, as he explains it, does not in truth constitute a progressive life; and this, not merely because progress implies a recognisable end, but because the renunciation is purely formal, that is, based upon the recognition of laws which are not only immutable and, in the last resort, inexplicable, but which have no essential relation with the life which they determine. The so-called progress is a merely formal adjustment of human life to inexplicable necessity; not progress towards a fuller, completer life, whose end is to

realise itself not merely as the shadow of the necessary but as its substance and presupposition. I may express this otherwise. According to Mr. Spencer, the fabric of the world is formed of necessity and chance. Chance, at the beginning, determined the course of events in the world, though, by some means, this course, when once taken, is no longer the mere creature of chance but assumes fixity, and then, as the necessary element, co-operates with chance in determining the subsequent course. He thus ascribes to chance a reason of its own, by which it shapes the universe, and because of this ascription it is unnecessary for him to ascribe to reason itself an essential relation with the world; and human life, as conscious, thus becomes formal and aimless, empty and worthless.

This is the result of that interpretation of life which Mr. Spencer deduces from the recent discoveries of science, and which he maintains is final. Now, no theory of life can be satisfactory or complete which is not in essential harmony with the facts of science,—the facts, as distinguished from the theories deduced from these facts by scientific men. If then we accept as true those facts of life which the labours of scientific men have lately revealed; if we admit that the discoveries made in Geology and Biology force us to the conclusion that "the present conformation and composition of the earth's crust, the distribution of land and water, and the infinitely diversified forms of animals and plants which constitute its present population, are merely the final terms in an immense series of changes which have been brought about in the course of immeasurable time by the operation of causes similar to those which are at work at the present day";—if we admit this, are we also forced to the conclusion that the theory, of which Mr. Herbert Spencer is the most distinguished exponent, is an adequate explanation of the facts of human life in so far as human life is distinguished from mere animal life?

This question has been answered once for all by the late Professor Green; and those who desire a detailed answer are referred to his writings, more particularly to the series of articles which appeared in the *Contemporary Review* in 1877-8. I can give here only a brief summary of results.

Mr. Spencer discusses his theory of knowledge after discussing and accepting the theory of evolution as an adequate explanation of the world. He finds that, as the world has actually developed itself, each higher species of life succeeded the lower in such a way as to preclude the idea that any species had a conscious part in the production of any other

species; in such way also as to destroy the idea that there was any conscious or final purpose determining the succession as a whole. The laws which now regulate the living world are the laws which have made that world what it is. In them that world is summed up and finds its explanation; and beyond them, to that common source which they suggest but do not reveal, none of the special forms of life can penetrate. Man therefore had as little to do with the production of the world as it existed before his appearance, as that pre-existent world had consciously to do with the production of man. His destiny is linked to the world as a whole by the same laws as link together the destinies of the lower species of life. But although his destiny is thus the same as the destiny of all living things, although he too is the creature of laws from dependence on whose action he cannot free himself, he is endowed with a power peculiar to himself, the power of consciousness, the power of obtaining a knowledge of the entire system of laws and of acting in conscious harmony with them.

Whence does this endowment spring? How is consciousness related to the world at large? The obvious answer, according to the theory, is that the relation is that of shadow to substance. The world is already, independently of consciousness, an ordered system, and the function of consciousness is to produce in itself a counterpart or reflection of this order. But how does this formal consciousness come into connexion with its material? By what means does it retain and compare those phenomena in which the laws are expressed? It has, to begin with, nothing peculiarly its own, nothing by which it could enable the individual subject to distinguish himself from the individual phenomena presented, and thus to characterise and retain them. It is, in fact, to begin with, not there at all; but appears only after the lapse of time, as the gradual result of the action of the world on the individual subject. What then is the character of this action, and how does the result spring from it? The sole gateway of communication between the individual and the world is feeling or sensation. But feelings or sensations are, in themselves, momentary and perishable. They come and go, and tell of nothing beyond themselves, because to do so would not only imply the something beyond, of which they do tell, but also another something to which each makes its report, something which must have been there from the beginning, and could not therefore have been the result of the operation of an external agent. But before feelings can become known, that is, marked off from each other by dis-

tinct characteristics, become reports of individual objects, they must in some way be retained and compared, be in some way related to each other. How is this possible? The answer briefly is, that repetition leads to retention. Feelings by repetition gradually create tendencies towards retention which are hereditarily transmitted, and these tendencies gradually develop into complete consciousness. Thus, though there is no power of retention to begin with, yet repeated feelings, though there is nothing to which they can repeat themselves, create tendencies towards retention in a something which is not a feeling or a collection of feelings, and cannot be consciousness, because consciousness is the result of the retention. Here then we have assumed, and not accounted for, the relation of succession as that of which the experience generates the tendencies described. But feeling following feeling, *ad infinitum*, does not constitute a succession except as held together by a something else present equally to each of them; and this something else is, by the hypothesis, excluded from the succession. Thus the explanation of consciousness as the result of the transmission of tendencies which are created by the regular action on feeling of the systematised phenomena of the world is self-contradictory; for, in the absence of everything but the succession, the succession itself could not be.

I need not dwell upon the "unknowable source of knowledge," which Mr. Spencer's theory of consciousness forces upon him; nor need I dwell, further than I have already done, upon his account of the relation between the "great unknowable First Cause" and the religious consciousness, as that relation has manifested itself in various forms in history. If his theory of consciousness destroys the possibility of any knowledge, there is no need to dwell upon what it confessedly knows only as unknowable.

What I have thus far aimed at showing is that consciousness as explained by the doctrine of evolution is not what consciousness actually is; that it is not merely formal, but that the most elementary knowledge, the power on the part of consciousness to seize a single phenomenon, necessarily implies the power to distinguish between the conscious subject and the object of consciousness, and also the power to distinguish, however vaguely, between both subject and object and that totality or world of which they are mere parts. There could be no conscious subject without an object of consciousness, and there could be no object of consciousness unless there was implied, in however general a form, a totality of objects, of which this particular object was a

single member. The relation here is a mutual one, no member being independent of the other, each having its reality not in itself but in the others and the whole.[1] In other words, the most elementary knowledge implies that threefold relation which all knowledge, the most complex as well as the most simple, only serves to bring into clearer light; and the attempt to trace the origin of knowledge beyond a consciousness so constituted can only be compared to an attempt to get outside the universe. According to this theory of consciousness, then, the history of mankind is the history of the effort on the part of the individual subjects to grasp, through a slowly acquired knowledge of the contents of the world, the character of that totality, of that Godhead, which is not only the source but also, from their nature, the substance of both. It is the progressive effort to realise, through knowledge, the unity of the divine and human, a unity which is expressed in all aspects of life, but which finds its highest realisation in religion.

In what remains of this paper I shall deal very briefly with—

(1) The characteristics of consciousness in so far as consciousness is distinguished from mere animal life.

(2) The means by which conscious life realises its end.

(3) The form in which the perfect conscious life embodies itself.

(1) Reason, the system of law which explains the phenomena of the world, is the very essence of the world; and it is in man alone, of all existent beings, that this reason becomes conscious; it is in him alone that reason urges towards self-knowledge. The lower animals are, like man, the outcome, the expression of the great process; but they neither know that they are so, nor seek to know it. Man is the only animal that seeks to know that life of which he, as a mere individual, is, like the lower animals, the momentary expression; but of which, as self-conscious, he is the eternal essence. In all lower grades of life, action takes place in a direct natural fashion: it is not mediated, *i.e.*, determined by a consciousness of its own character. This is the important point. Not only do all actions in the brute world take place according to reason, according to laws which are

[1] It seems hardly necessary to point out that the reality which the world had before the manifestation of consciousness in time was not a reality independent of consciousness in the sense in which Mr. Spencer maintains, but a reality which is truly understood only when seen in every stage to imply, and in the final stage to result in, consciousness or self-completion.

capable of being determined by us; but the development of physical life is itself essentially rational, groups itself into species, and this reason, this process, for the first time becomes conscious of its own nature, its own character, in man. Man is, in one point of view, the outcome, the creature of this process of life; and in another point of view he is the conscious realisation of this process; and in this consciousness he becomes free. The brutes are not free: they do not know the character of their actions, they do not know the system, the purpose by which these actions are determined; they act in blind obedience to impulse. The destiny of man, on the other hand, is to realise his own freedom, his spiritual freedom, that freedom which springs from a knowledge of the system of which he is not only the highest expression but also, from the very nature of the process, the absolute substance: to realise his emptiness, his worthlessness, as a mere individual, but his essential infinite worth when he realises his oneness with the universal aim, with God made manifest. It is this destiny that is slowly accomplished in the course of history.

Thought then, spirit, as distinguished from the physical world, is nothing other than that world made conscious of its own purpose, its own end, made free; for spirit becomes free when confronted by no absolutely alien world, but by a world in which it has its source and of which it is the end and aim, by a world which is the expression of itself. Thus then the destiny of the world of thought, of spirit, and, since this is the substantial world, that towards which the physical world was continually urging and in which it reaches its full expression, the final cause of the world at large, is the consciousness of its own freedom on the part of spirit, and the realisation of that freedom, its application to the relations of actual, present life. This final aim is God's purpose with the world; but God is the absolutely perfect being, the source and end of all being, who can therefore will nothing other than Himself, His own will. The very nature of His will, that is His very nature itself, all-embracing and all-determining, is what we here call Freedom. To obtain this Freedom in its complete form, to realise the unity of the divine and human, is the object of the world's action, that which gives continuity to the life of man, and that which makes a Science of History possible.

This object is at first general and abstract. It has not received real, outward expression. All aims partake, at first, of this abstract, unreal character. In all stages, short of the complete realisation of freedom, men are not fully

conscious of their own nature, of their relation to the world's purpose, to God. That full, complete consciousness came with Christianity. But even the precepts of Christianity were at first nothing more than abstract principles; and were so far untrue, unreal. According to these precepts, *e.g.*, all men are brothers, deriving their existence from the same source, subject to the same great law and government, and through this law and government made free. But this truth was at first in the air; it had not merged into actual existence. In proof of this I need merely note that slavery did not cease with the introduction of Christianity, nor was law made harmonious with freedom. This application of the principle to political relations, the thorough moulding and interpenetration of society by it, is identical with the process of history itself. The realisation of the end is thus a gradual one, a process has to be passed through, and this process constitutes history.

(2) By what means does this process realise its end? The end is the perfected life of man, the bringing of all men's actions into essential harmony with divine justice, the making all men one in and through the knowledge of the world's purpose. This end implies that there was at the beginning the very opposite of an essential unity of interest, that there was a collection of conflicting interests, that the springs of action were passions, private aims, the satisfaction of selfish desires. These passions, private aims, in the conflict which necessarily takes place between them, are the means for the development of freedom, of that life whose very essence is law and order. Thus, to adapt words of Darwin, from the war of Passion, no matter in what form it may display itself, the true, the complete life results. The process here is, in one aspect, a natural one—the mere conflict of the Passions, of the strictly individual interests, and of the evolution of those conditions best suited to social life. This is the only aspect of the process dwelt upon by Mr. Herbert Spencer. But the end, and the presupposition of the whole process, is the very opposite of natural; for the conflict develops not only better conditions of life, but the consciousness of the character of these conditions. It is important to comprehend this distinction. The destiny of man is to make the world of nature, of which he is the outcome, conscious of its own purport, and to transform his individual life in accordance with this consciousness,—to overcome the natural, unreflecting life of the individual, and to replace it by the spiritual, conscious life, which is essentially one and universal,

—the presupposition of all. Man is no mere creature of conditions that are imposed from the outside by some alien, unknowable power, to which he blindly submits; for he is able not only to demonstrate in each condition its specific aim, but in the whole the grand object of the world. He is able to demonstrate that the conditions of knowledge are also the conditions of the world, of the known thing,—that neither could be without the other; to demonstrate that the conditions of knowledge do not appear for the first time in man, but are immanent in every grade of the world, but know themselves as essential conditions only in consciousness. He is able, in a word, to demonstrate that Thought, the essential, in its threefold relation, is not only the outcome of the world's development, but its presupposition. Man, therefore, is free, not in spite of, but in and through the conditions of life. The conditions are the realisation of the complete life.

I cannot pause here to show the unthinking character of the conception of God, as an empty, unconditioned something, entertained by Mr. Spencer. I merely remark that a God who did not necessarily manifest himself, could not be the source or end of the universe, but must be an empty abstraction, a fiction produced by an incomplete theory. He is the source and aim of conditioned life, and in this conditioned life, therefore, he is free. Beyond conditioned life it is as impossible for God as it is for thought to pass. To the level of this freedom, to the knowledge of the source and aim of the world, to the knowledge that all things work together for one end, to the full enjoyment of sonship in the Father, it is the destiny of man to rise. Summing this up, we find that human life is not merely that natural adjustment to the conditions of general life, which is conveyed in the phrase "Survival of the Fittest"; but is that adjustment which through consciousness adapts itself to the end.

(3) I now pass to the third point: What is the object to be realised by these means, *i.e.*, what is the form it assumes in the realm of reality? It is in human knowledge and volition that Freedom, the end and aim of life, attains positive, conscious existence. Here the individual will in its consciousness of the essential, divine life, in its consciousness of the purpose of all existence, has itself essential existence. This essential existence is the union of the individual will with the divine will, the divine purpose; and this union finds its highest expression in the State. Whenever men, through the natural conflict of interest, pass out of the

primitive barbaric condition, and form for themselves a State, that conflict has been, so far, overcome, and a certain unity of interest, which expresses itself in Religion, in Law, Morality, Government, has been established. The State then, with its laws and institutions, its government and morality, is that form of reality in which the individual has and enjoys his freedom. It is the actually existing realised moral life; for it is the unity of the universal essential will with that of the individual. The individual, living in this unity, has a moral life, possesses a value, that consists in this substantiality alone. It is the very object of the State that what is essential, what is in harmony with the great purpose of the world, in the practical activity of men, should be duly recognised, that it should have a manifest existence and be able to maintain its position. In the history of the world only those peoples can come under our notice which form a State. For it must be understood that the State alone is the realisation of freedom, *i.e.*, of the absolute final aim which determines the course of History. It must further be understood that all the worth which the individual possesses, all spiritual reality, he possesses only through the State. For his spiritual reality consists in this, that his highest life, which is one with the aim of the world, possesses for him, not a merely abstract empty existence, but a real outward existence in the world. It is only in the full knowledge of this existing real life that he becomes fully free, fully conscious. It is only through this real existence that he becomes a partaker of morality, of a just and moral social life. The State is the divine idea as it exists on earth. We have in it, therefore, the object of history in a more definite shape than before: that in which freedom obtains real existence. For law is the reality of conscious life, volition in its true form. Only that will which obeys law is free; for, in obeying law, it obeys that which expresses its own nature and aim, and so is free. Law has necessary existence as being the reality and substance of things, the conscious expression of the divine purpose; and we are free in recognising it as law and following it as the substance of our own being. The divine will and the will of the individual are then reconciled, and present one identical, homogeneous whole.

The State then is the manifestation of human will and its freedom. It is to the State therefore that change in the aspect of history indissolubly attaches itself; and the successive stages by which spiritual freedom, the end, is realised,

manifest themselves in history as distinct political principles, distinct forms of State-life.

We have thus far established two elemental considerations: first, the idea of freedom as the absolute and final aim; second, the means for realising it, *i.e.*, the subjective side of knowledge and will with its life, movement and activity. We then recognised the State as the moral whole and reality of freedom, and consequently as the objective unity of these two elements. The State is, therefore, the basis and centre of the other and concrete elements of the life of a people, of Art, of Law, of Morals, of Religion, of Science. All the activity of Spirit has only this object, the becoming conscious of this union, *i.e.*, of its own freedom. Among the forms of this conscious union, Religion occupies the highest place. Religion is, in a special sense, that form in which man expresses his oneness with God; but all manifestations of life, in so far as they are realisations of freedom, also show forth this unity. In Religion, spirit, rising above the limitations of mere secular existence, becomes conscious of the absolute Spirit, and in this consciousness of the self-existent being renounces its merely individual interest. With this self-renunciation, whose aim is to obtain freedom, true life begins. I have said that Morality is the identity of the individual will with the will of God. Now the mind must give itself an express consciousness of this identity; and the focus of this knowledge is Religion. Art and Science, when truly seen, are only various aspects and forms of the same substantial being. Religion is the form in which a nation gives itself the definition of what it regards as the true, that which it regards as the explanation of existence. The conception of God, therefore, constitutes the general basis of a people's character. In this aspect Religion stands in the closest connexion with the political principle. All religions realise, in a more or less complete degree, the relation between the divine purpose and human life, the principle of freedom. But full freedom can exist only where the individual is recognised as having his positive and real existence in the universal aim; where the actions of the individual are sanctioned not by the will of another individual, nor by any compact or arrangement between individuals, but by Religion, by the very constitution of existence. This means that the practical work of the individual has not in itself that absolute validity, that absolute claim to recognition, to which even kings and governors must bow, except in so far as the principle that pervades it receives absolute validity; which it cannot have unless it is recognised as the definite manifesta-

tion, the phenomenal existence, of that divine spirit which constitutes freedom. The State is thus always more than a mere collection of individuals; because it is the realisation of that freedom to which the individual must conform himself in order to become free. It is this that explains the saying that the State is based on Religion. The form of Religion decides the form of the State and its constitution. The latter actually originated in the particular religion adopted by the nation; so that, in fact, the Chinese, the Hindoo, the Persian, the Egyptian, the Athenian and the Roman States were possible only in connexion with the peculiar form of religion existing among these peoples; just as a Catholic State has a spirit and a constitution different from that of a Protestant one. I may illustrate this remark by noticing the folly of pretending to invent and carry out political institutions independently of religion. The history of France during the present century furnishes an example. That country is Catholic, and the Catholic confession, although sharing the Christian name with the Protestant, does not concede to the State an inherent justice and morality, a right independent of the will of any individual or class of individuals, a concession which, in the Protestant principle, is fundamental. Roman Catholicism and constitutional government are absolutely incompatible; and the attempt to build up a constitution uninfluenced by any religion, as France will be forced to do, so long as it remains Catholic, can produce only an absolute unrest. A political revolution can obtain stability only if it is the result of a religious reformation, of a distinct advance in the conception of freedom.

Only in connexion then with a particular religion can a particular constitution exist. From the fact that in Religion all distinction of person disappears, that in it all men become one, it follows that each particular nation having, for the basis of its life, its own conception of the divine, is to be treated as only one individual in the process of universal history. For that history is the exhibition of the divine absolute development of spirit in its highest forms, that gradation by which it reaches the perfect life in God. The forms which these gradations assume are the characteristic "National Spirits" of history, the peculiar tenor of their moral life, their government, their art, religion and science. To realise these grades is the boundless impulse of conscious life—the goal of its irresistible urging.

One word, in conclusion, in reference to the course of the world's history. Each people that is forming itself into a

State does so on the basis of religion, on the basis of its own conception of the relation between the world and the divine, between the life of the individual and that universal life, which is its presupposition and aim. It is its religion that forms the distinctive characteristic of a people. It is this alone which takes the lead in all the deeds and tendencies of that people, and which is occupied in realising itself, in making its real life correspond with its idea of the divine. This harmony each people is destined to accomplish for itself; but its accomplishment is at the same time its dissolution as a historical people, and the rise of a new religion, another world-historical people, another epoch of universal history. This transition and connexion leads us to the idea and connexion of the whole, the idea of the world's history as such. To comprehend the thought involved in this transition, the study of history itself is necessary. The fundamental necessity of the transition lies in the fact that national activity ceases when the religion which it embodies reaches its full realisation in life, when the object of all its endeavours is accomplished. When this is reached the activity displayed by the spirit of the people is no longer needed; it has its desire; and the bond of union, which implies combined exertion for some object not fully realised, disappears. The contradiction between its inner aim and life and its actual being is removed; and what had been its aim becomes, as it were, the property of the individual. Enriched by this spirit—the final result of the labours of the nation—the individual assumes an attitude of superiority, of criticism, towards the laws and institutions by which the national endeavours had been guided; and private interest becomes predominant. In order that a truly universal interest may again arise, a principle of a new order, a new national spirit, must show itself. This is the soul, the essential consideration in the scientific comprehension of History.

The conclusion of the whole matter is this, that the History of the World aims at the realisation of a complete harmony between man and God, the realisation, through a painful process of self-conflict and self-conquest, of that freedom, which is the same in spirit as the love taught by Christ, the realisation of a State in which the interest of each will be the interest of all, and the interest of all the interest of each; and it is in the light of this aim that all progress in history must be interpreted. The true believer in the ultimate complete realisation of a kingdom of Christ on this earth does not confine his vision to the future, but recognises the development in the past and the essential worth of the present.

IV.—SPACE AND TOUCH, II.[1]

By Dr. EDMUND MONTGOMERY.

V.

WHETHER geometrical truths rest on experience conveyed through the ordinary sensory channels, or whether they originate transcendentally through purely mental processes or through an intuitive recognition of eternal relations—are questions that have been much discussed of late. Indeed it is not difficult to apprehend that the validity of Experientialism on the one side, and of Transcendentalism on the other, is strictly dependent on the decision here arrived at. If it can be shown that geometrical constructions—through complications of which all spatial forms whatever are producible—may be mentally fashioned without the aid of immediate or remembered sensorial impressions, then extreme Transcendentalism has an easy task. For the secondary qualities of so-called things—their touch, colour, sound, taste and smell—have long been recognised as truly mental possessions; which renders it impossible for them to constitute at the same time properties of extra-mental existents. Now, if the spatial forms, in which these secondary qualities naturally seem to inhere, are themselves spontaneous products of the mind, it is obvious that the whole object with all its qualities, primary and secondary, must be mentally originated. And if the whole make-up of spatial objects is thus originated, then their changes are of necessity likewise operated by purely mental functions.

Thus would mind, even such mind as we have, be established as creator of all the universe we perceive—that is, if mind were really competent, by its own spontaneous powers, to construct spatial forms. A geometry produced transcendentally by mental synthesis implies the fashioning and endowment of the entire content of consciousness by the same agency and from the same source.

Though it must be admitted that all perception, and therewith everything in perceptual appearance, is truly mental, our practical sense strenuously opposes the conclusion that such mental appearances are transcendentally *effected*, that

[1] Continued from MIND XXXVIII.

they are in verity spontaneously produced by something within us which can rightly be called a mental energy. We are too well aware, not only during the realisation of secondary qualities, but also during the formation of the particular shapes recognised in actual perception, that it is something not belonging to our own mind, something in existence besides ourselves, which is persistently coercing us. Our most fundamental scientific classification is based on this conviction of two entirely distinct spheres of existence, the one a world of conscious realisation, the other a world of extraneous, sense-compelling powers.

While consciousness itself is studied by psychological science, it is the nature of the extra-mental but mind-coercing existence or existences that physical science seeks to investigate. Evidently we can arrive at conclusions concerning the nature of extra-mental existences only by investigating the manner and order in which they awaken conscious states in us. But conscious states thus awakened form, as such, also part of the subject-matter of Psychology. And as we find ourselves capable of utilising at will the agency of special extra-mental existents for the purpose of awakening definite conscious states, we are in a position to study these conscious states by means of a voluntary handling of the particular powers which arouse them.

Extra-mental powers, when awakening our perception under the same conditions, range themselves naturally in two distinct systems. The one of these perceptual complexes we call our organism; the other we name the outer world. To a spectator the organism of another subject constitutes in all respects just as much part of the physical world as any other perceivable object. But to the subject to whom the organism particularly belongs, this special physical object, besides forming like other objects part of his perceivable physical world, stands in many other most intimate and quite specific relations to his consciousness.

It is now very generally admitted that this consciousness of ours is never awakened without a definite disturbance taking place concomitantly in our so-called organism, which is itself perceivable as a physical object; and that definite varieties of such disturbance correspond to definite varieties of conscious states. We can experimentally convince ourselves that definite conscious states are awakened by the influence of definite extra-mental powers, and that the immediate effect of such outside powers on our individuality consists in a specific commotion within our organism perceivable by an observer. Thereupon, often in

a measurable time, the conscious effect arises in our mind. Now, as the physical commotion in the organism manifestly precedes the mental effect in the bearer of the organism, it is fair to conclude that all mental states are really awakened and not merely accompanied by the specific commotion perceivable as a definite molecular activity by an observer. Every conscious state can therefore be legitimately regarded as awakened either indirectly by powers outside the organism, or directly by extra-mental powers constituting the organic individuality itself.

To the growing recognition of these uniform relations between mind and body is due the reconciliation of philosophy and science now in progress. In England genuine sensory impressions and physiological energies had to come to the rescue of the associative powers of pure ideas, in order to allow philosophers to regain a hold on the world we actually live in. And in Germany the scientific vagaries of the "Naturphilosophie," as well as the philosophical crudities of materialistic science, gradually gave way before the demonstration of the rigorously dependent, yet thoroughly mental, outcome of specific physiological energies definitely stimulated.

Prof. v. Helmholtz, by his classical psychophysical investigations and the philosophical conclusions connected therewith, has conduced more than any other single person to this reunion of science and philosophy. He is quite ready to concede that the cause of sensorial awakenings is hypothetical in its nature, but he maintains that, whatever that cause may be, it is not inherent in our own mind, and is always operative in geometrical constructions. Even granted that space itself may be an original mental form, its geometrical specifications are nevertheless experiential. They are, according to him, compelled by powers not under our own control. A line, straight or curved, or the geometrical relation of a number of points, is a spatial disposition experienced by actual presentation to touch or sight, not something brought into existence by spontaneous mental creation. In geometry we are dealing with actual sensorial impressions, and not with synthetical actions of pure thought. What we know of spatial relations, he further concludes, we have learnt through experience, and it is due to the peculiar nature of this experience that our space-perception is fashioned as it is. A different experience, one, for instance, derived only from impressions emanating altogether from a surface, would yield a space-perception of but two dimensions; and from possible data we are able

consistently to build up a number of differently constituted spaces. Their realisation in perception would be only a matter of practice. The most we can assert regarding our relation to the special influences surrounding us and compelling our space-perception, is that they must be so composed as to induce us to form our particular space of three dimensions.

This reasoning, based as it is on positive investigation and clear conception, must be allowed to have great force, especially when contrasted with the teachings of Transcendentalism on the same subject. To candid reflection it must ever remain unintelligible how a purely mental activity, without the assistance of even remembered experiential data, can be competent to create geometrical relations; how thought, unaided by an experientially fertilised imagination, can at all avail by a spontaneous activity of its own to introduce into the blank form of space any kind of geometrical construction.

Nevertheless, on close examination, it cannot be denied—in opposition to Prof. Helmholtz and all those who with him seek to ground geometrical truths on sensorial impressions awakened by foreign agents, and in spite of a seeming agreement with Transcendentalism—that the realisation of spatial relations is in truth independent of outside compulsion, like our space-perception itself. This latter we have found, on careful scrutiny, to be an essentially subjective experience, coinciding with objective experience through an organically pre-established harmony.

Prof. v. Helmholtz himself states with great precision the conditions that would have to be fulfilled for the construction of a geometry independent of outside influences. He says, and every sentence of the statement deserves to be well pondered—

"The whole of Euclid's geometry can be derived from the formula which determines the distance of two points as a function of their rectangular co-ordinates. Now, if we assume that the intensity of a psychical effect, whose equality appears in perception as an equality in the distance of two points, is dependent on any three functions of the topogenous moments of each point, in the same manner as the distance in Euclidean space is dependent on the three co-ordinates of each of its points; then the system of pure geometry of such a consciousness would conform to the axioms of Euclid, however the topogenous moments of the world of reality and their physical equivalence might be constituted. It is clear that, in this case also, the coincidence between the psychical and the physical equivalence of the spatial magnitudes could not be deduced solely from the form of perceptual intuition. And if coincidence were actually to disclose itself, then it would be due to a law of nature, or, as I have expressed it in my popular lectures, to a pre-established harmony between the world of

perception and the world of reality" (*Thatsachen in der Wahrnehmung*, App. III.; *cf.* the same author's second article, "The Origin and Meaning of Geometrical Axioms," in MIND X., pp. 222 ff.).

Here Prof. v. Helmholtz, with a keen insight into the conditions requisite for the fashioning of a mental geometry, unaided by the physical facts of the world of reality, has, as before hinted, given an almost correct description of what actually occurs as a specific energy of our nerve-system during the tactile specifications of our general spatial feeling. But, led by his own theory of space, founded chiefly on the experience of visual surface-dimensions, whose "topogenous" moments are invariably aroused by outside existents, he has overlooked the peculiarity of tactile space-sensation, and, in conformity with Transcendentalists, has assumed that, if the geometrical relation of two points could indeed be recognised by an immediate psychical act, then we should have a genuine transcendental geometry, a geometry created by spontaneous functions of the mind, and standing in no direct relation whatever to the physical geometry applicable to the "topogenous" moments given or rather enforced from some source outside ourselves. What he calls the world of reality, in contradistinction to a psychical world intuitively arising, is emphatically the sphere of compulsion *ab extra*, the real subsistence of causative influences independent of our own being, whose orderly effects are the exact specifications, "topogenous" and "hylogenous," localising and qualifying, of our actual perception.

Had Prof. v. Helmholtz chosen to direct his attention to tactile space with only half the ability with which he has dwelt on visual space, he would soon have detected that the "topogenous" moments of tactile space may be voluntarily presented to our perception, or rather voluntarily awakened therein, and that they are, moreover, *immediately* perceived as standing in a definite geometrical relation to our focus of apperception. I feel as specific "topogenous" moments in an act of immediate sensation, or rather perception, the exact position of what, through the experience of sight and objective touch, I know to be my great toe. Here the psychical realisation of distance and position is certainly immediate. I directly perceive the sensation just so much below, so much in front, and so much to the left of my apperceptive focus. The definite place in space thus perceived by me as a peculiar sensation, and my apperceptive focus, from which mentally that place is perceived, are two distinct spatial points immediately cognised, and standing in a rigorously fixed relation to each other. They are de-

terminate "topogenous" specifications of my general space-consciousness. And with this single mental experience, unfertilised by influences extraneous to the felt positions, all essential geometrical relations are given.

The possibility of establishing on the same intuitive basis a complete geometry is afforded in the fact that, through the instrumentality of the "topogenous" moments awakened by the immediate sensation of the position of any of our movable organs, our finger-tip for instance, we can at will make any specific determinations that consist with our potential space-consciousness. Whatever shapes may possibly be constructed in space, we can ourselves spontaneously produce their "topogenous" moments, by means of the strictly localised sensations which follow and duplicate subjectively the objective tracings of our voluntary moving organs. True, the spatial coincidence of such immediate sensorial perceptions with the objectively ascertainable position of the organs with which they are connected and whose functions they really constitute, has to be looked upon as accomplished by a pre-established harmony; but it is one organically evolved, and not any kind of two-clock-arrangement.

How entirely distinct, and yet intimately connected, the two coinciding aspects of space-relations actually are may be easily realised. I close my eyes and stretch out tightly one of my forefingers. Directly I feel, without the least help from remembered touch or sight, a complex of localised sensations which I know to occupy the exact position of what, by touch or sight, I might objectively ascertain to be my tangible and visible finger. I stretch out my other forefinger, and am aware of its existence and position in the same manner. Thereupon I set about exploring my left forefinger with my right forefinger. Instantly the mere contact effects a magical transmutation, nay, a veritable transsubstantiation. My right forefinger no longer feels itself, but, with utmost distinctness, it feels—the left forefinger.

If there is in nature one fact more marvellous than another, surely it is here before us. The very same felt positions which a moment before revealed to me most distinctly the existence of my right forefinger, now reveal to me with the same certainty the existence of my left forefinger. To bring about this complete metamorphosis of perception and recognition, nothing has occurred in the exciting conditions but a slight modification of surface-stimulation. The qualitative sensorial potentialities and the sense of resistance have been awakened in a specific manner, and this has sufficed to trans-

form the feeling of the positions and peculiar intrinsic qualities of the one finger into a feeling of the positions and peculiar extrinsic qualities of the other finger. The whole of this sudden objectifying and externalising change has happened exclusively in the tract of the exploring finger, for, instead of the felt finger, an imitation in wax or india-rubber might as well be substituted.

It is with touches thus amazingly subtle and positive that nature elicits from us the objective figurations of our mind. They are clearly only definitely induced modifications of our own individuality. The self-feeling of our organised being has in its specific qualifications, through attunement to the surrounding world, been rendered significative of all its multifarious bearings upon us. Thus the geometry awakened through immediate topogenous sensations, finds itself in correspondence with the geometry awakened by the space-determining influences inherent in outside existents.

Qualitative or "hylogenous" specifications are, during actual perception, normally aroused by specific stimuli extraneous to the stimulated organs. This is the case also when they are being aroused by powers forming part of our individuality, as, for instance, when, by touch or sight, we are exploring some region of our own organism.

Spatial or "topogenous" specifications, on the other hand, may be aroused as immediate sensations without the aid of extraneous stimulation, solely by means of the self-feeling of our movable organs. The very line traced by a finger and subjectively or immediately felt as a definite continuity of positions originating from within, is, when traced by the same finger in contact with some outside body, felt as the same continuity of positions, but this time plainly as induced from outside.

Let it be once more repeated that it is altogether due to pre-established harmony that definite configurations of "topogenous" moments, induced through the voluntary and self-felt action of our own members, may also be forcibly induced from outside. But it is obvious that the geometrical specifications, since they are really capable of being subjectively or immediately presented to perception by means of faculties dwelling within ourselves, cannot rightly be regarded as primarily dependent on the nature of extraneous existences.

The positions of our sensory surface, together with certain internal qualitative differences giving rise to a distinctive cognition of its sundry parts, are immediately felt by us, while the specific modifications of this self-feeling are

experienced as appertaining to existences beyond our skin. This detaching from ourselves of the compulsory sensations, which build up the outer world in perception, is greatly aided by a peculiarity of our visual organ. Unlike what takes place with tactile sensibility, the sensory terminations of our seeing surface do not awaken any localised and specific self-feeling. The retina is not itself represented in consciousness by a subjective awakening of "topogenous" and "hylogenous" energies. These are, however, aroused with extreme readiness, in its case, by objective conditions. It has often been said that the eye sees everything, only not itself. It cannot be maintained in the same way that the finger feels everything, only not itself. This physiological peculiarity of the eye constitutes it pre-eminently an objective sense, which means really nothing more than that, "topogenously" and "hylogenously," it is in its most essential sensory region exclusively stimulated from outside, reacting in such a manner as to arouse corresponding spatial and qualitative specifications in our potential consciousness.

Here it may as well at once be added that, by means of visual "topogenous" specifications, the identical space-consciousness is awakened, which otherwise, and more directly, is also awakened by tactile specifications. The eye is a movable organ, with a definite spatial reach, like the arm or the hand, realising specifications of one and the same individual space-perception. Visual phenomena stand, indeed, to a great extent only as signs for tactile possibilities, but not as Berkeley thought, because sight is altogether trained on the experiences of touch; rather, because visual stimulation awakens centrally the same specifically established energies that are also awakened by tactile stimulation.

The subjectively organised and volitional priority of spatial determinations or geometrical relations evinces itself, even in practical life, in the familiar fact that it is we ourselves who, in our measurements and constructions, usually impose upon nature fundamental geometrical relations, and that we feel rather surprised when we find simple geometrical relations obtaining among natural objects. No special experience, no kind of specific outside stimulation continued all through individual life, could make us realise a space essentially different from our own. In order to establish a mental correspondence with extraneous influences compelling a different space-perception, our whole organisation, from periphery to centre, would have to be

radically transformed. We should then be completely different beings, realising a completely different world.

Analytical processes, logical and mathematical, rest on identity. But as the realising potentialities of our own personality constitute the veritable medium of all cognition, the principal conditions of this identity are inherent in our own modes of perception and conception. It is, therefore, indispensable that the exact relation of outside existents and their combinations to these our modes of cognition, should be correctly implied in logical premisses and mathematical statements. Otherwise, however correctly our analytical evolutions may be carried on, the verification of their results, which is the realisation of their actuality by means of our own modes of cognition, could not be effected, and such analytical results would, therefore, possess no value for our understanding of reality.

Geometry is certainly not transcendentally constructed by spontaneous mental action. It has been sufficiently proved that its "topogenous" moments are always awakened in consciousness by extra-mental powers. But certain of these extra-mental powers, belonging to our own organic individuality, are so peculiarly related to our mind as to awaken immediate "topogenous" sensations, and it is this fundamental organic capacity that renders spatial determinations independent of extraneous or so-called realistic stimulation.[1]

VI.

Berkeley's *Theory of Vision* is the veritable historical starting-point of psychophysical investigation. Nominalistic Idealism, its direct offshoot, resulted from the erroneous subsumption of the extensive qualities of the objective aspect under the scholastic notion of a purely intensive mind. Extension, which by Descartes and his followers had been declared the fundamental property of an extra-mental world, became now sublimated into a mental phenomenon experienced by a perceiving soul. But as everything mental had—in conformity with philosophic prejudice—to be simple and indivisible, Extension with its manifold

[1] In my criticism of the Kantian theory of knowledge (*Die Kantsche Erkenntnisslehre widerlegt vom Standpunkte der Empirie*, München, 1871), I have in a chapter entitled "Das *a posteriori* Element in der Mathematischen Synthese" advanced an explanation of geometrical construction in essential agreement with the one here given. Only, at that time, I vaguely ascribed to muscular sensations what I now know to be accomplished by directly felt positions not dependent on sensations of movement.

parts could not possibly be admitted to constitute an original affection of our indiscerptible inner Self. It had, consequently, to be made up of an aggregation or combination of some of the soul's intensive states. And here the inwardly felt sweep of a moving limb, consisting of nothing but a number of successive instants in consciousness, and yet tracing objectively veritable Extension, seemed to afford a ready clue for the mental synthesis of outspread Space from a mere succession of intensive sensations.

The mistake of trying to reduce the primary qualities, and with them the perception of the entire physical world, inclusive of our own physiological individuality, to a mere succession of unextended ideas, had further the immediate effect of rendering wholly inscrutable not only the observed object, but also the observing subject. For in a universe dissolved into a bare sequence of unextended ideas, our own consolidated personality utterly vanished.

A systematic world-construction from agglutinated particles of evanescent, though revivable, feelings has been zealously practised in England by the Association-philosophy. This very successful mode of interpretation, in order to gain a solid foundation for its building-material, the elementary ideas, had however to introduce into its operations as much of our physiological individuality as would serve its purposes. When without this, it tries to derive all knowledge from an analysis of mental phenomena, followed by a purely mental synthesis of the elements arrived at by such an introspective analysis, it labours under a twofold psychophysical misconception.

First it ignores the fact that the causative powers underlying the objective aspect, the "permanent possibilities of sensation" compelling the specific arrangement of mental elements, are always represented as definite perceptual complexes during introspective investigation, attesting their coercing influence on sensorial grouping by the very presence in mind of the solid objects that have been forcibly shaped by them, and which, in their absence, remain as their effective signs. Now, as the veritable powers which have established the definite bonds between sensorial affections are themselves extra-mental, it is not likely that we should be able exhaustively to study the laws of perceptual combination by mere mental operations, unaided by experimental reference to the permanent source of stimulation and union which they represent. Who indeed finds himself ever thinking of feelings of touch without also calling into mind the organ of touch together with some

touched object, or sets about invoking normal muscular feelings as perceptual building-material without presupposing actual muscles? The Mills, Prof. Bain and Mr. H. Spencer, the most illustrious exponents of the Association-theory in our century—have they achieved their success in Psychology by strictly adhering to mental analysis and synthesis; or have they not rather succeeded in proportion as they have availed themselves of psychophysical data, yielded by physiological research under the indispensable and steadfast assumption of the permanent, extra-mental subsistence of that which we perceive as an animal organism?

The second psychophysical misconception leading thinkers to believe that introspectively the mental presence can be investigated without presupposing an organism of which it is the vital outcome, arises from overlooking the all-important fact of a definitely shaped and permanent self-feeling, composed of immediately localised sensations. In former sections I have explained why I think that this self-feeling is an effect of specific energies emanating from what we perceive as central nerve-structures. But it remains nevertheless certain that we feel the surface of our body in all its manifold positions as an immediate sensation, and therewith as a mental fact of the subjective order. Thus an internally felt spatial realisation of our body, corresponding to its experiential realisation in objective space, enters as an original ingredient into our mental presence. When we then, further, consider that the entire perceptual realisation of the objective world is made up of specific qualitative modifications of this original and organic self-feeling, we can surely not deem ourselves justified in believing that we may really omit in any investigation of mind this its most salient and comprehensive feature. Vivified by the magic touch of specific stimulation, our objectively unqualified, colourless self-feeling becomes pervaded with the variegated and multiform figurations, signifying the veritable world in which we actually live and have our being.

Thus vital organisation forms the medium of all our world-realisation.

Berkeley in § cxvi. of his *Principles* struck the keynote to most of the subsequent speculations on Space, consciously or unconsciously based on organic and vital data. He says:

"When I excite a motion in some part of my body, if it be free and without resistance, I say there is *space;* but if I find a resistance, then I say there is *body.*" "When I speak of pure or empty space, it is not to be supposed that the word *space* stands for an idea distinct from, or conceivable

without body or motion." "If my body were annihilated, then there could be no motion, and consequently no space."

For simplicity, we will assume that Berkeley in advancing these complex psychophysical statements had—in his space-construction at least—only the subjective aspect in view, the immediate feelings which accompany the objective movement of parts of our body. In this case, space would be identical with our feeling of motion. The feeling I have when with closed eyes I am moving my hand through a non-resistant medium, would itself be space. This very simple notion of space, quite in agreement with the supposition of a percipient mind purely intensive, seemed plausible from the point of view of Nominalistic Idealism. As soon, however, as philosophers began to examine more closely such sensuous space, constituted by mere feelings of motion, it became obvious that, while motion is itself pre-eminently a phenomenon of succession, the chief characteristic of space, on the contrary, is to have all its parts existing together at one and the same time. How to derive co-existence of spatial elements from a succession of unextended feelings, became therefore the chief difficulty which had henceforth to be encountered in the construction of extensive perception.

Brown, regarding time as a succession rendered continuous by memory, tried to evolve from it the chief attributes of extension, such as length and divisibility. He believed that, in the succession of muscular feelings accompanying the movement of our limbs, length or extension is given. A particular muscular contraction becomes representative of a certain length. When we grasp an object, the knowledge that so much of muscular contractility remains unexpended yields us the measure for the extension of the grasped object. In proof that space is derived from the association in memory of successive feelings, he adduces the influence still exerted in adults by modifications of time-experiences on the realisation of spatial dimensions. He asserts, namely, that the extension of a given line is felt to be longer or shorter in proportion as we move our finger slower or quicker over it. He is quite positive that the difference of time occupied by the successive feelings expands or contracts the idea of length or extension.

I do not believe that any one who tries this easy experiment is likely to agree with him. Whether I move my finger slowly or rapidly over a given line, it appears to me always of the same length. The relative positions of the initial and the final contact to my centre of apperception,

by which I really estimate the distance, remain constant, whether I take more or less time to reach these definite localities. On the supposition that time itself contains longitudinal or spatial extension, any series whatever of remembered feelings would necessarily yield space-perception. As everyone will readily admit that this is by no means the case, succession or length of time cannot possibly constitute an essential and original element of Space.

An unsophisticated mind would think it obvious beyond controversy that, in spite of the lapse in time of all our feelings, there consciously appears within our mental presence, ready-made and persistently enduring, an unmistakably extended universe with all its parts simultaneously subsisting. But the real entities of our Experiential Idealists, their mental atoms, being considered by them unextended, they find themselves consistently forced to construct the whole mental presence out of such spatially non-existent and temporally evanescent Mind-stuff. This feat however will ever be found a business compared with which the labour of Sisyphus must be deemed mere play. For he, while performing it, had at least something to roll, something to roll with, and something to roll upon. But how to consolidate by memory or otherwise into simultaneous extension and actual presence successive moments of ever-fleeting time, irretrievably dwindled away into the past—this is a task which transcends all thinkable possibility.

Prof. Bain, to whom scientific thinkers owe so great a debt of gratitude, formulated his theory of space in times of pre-evolutional speculation, chiefly under the sway of the Association-philosophy. Conscious himself that feelings of succession cannot possibly yield perception of Extension, he is nevertheless led by the logic of a purely intensive medium of composition to construct space from a combination of successive feelings. If however, as he himself maintains, "motion is a fact of succession and can do nothing to suggest a group of contemporaneous phenomena, an outspread universe of the co-existing in time"; and if all our sensations, "warmth, odour, relish, touch, sound, colour, contain no elements of extension"; then it is quite certain that no experiential manipulation nor mental chemistry of any sort will ever avail to evolve from such mere instants of time genuine space-perception.

Prof. Bain, in common with other Idealistic Experientialists, holds that "motion is the fundamental fact" in extension, and this in spite of its being composed of nothing but successive elements. Of course he means by

motion, feelings of motion, and with him — as every student of philosophy well knows — feelings of motion are not centripetal sensations stimulated by the moved organs, but definite centrifugal feelings of so much energy expended in the innervation of muscles, which spontaneous feeling of exertion is found by experience to correspond objectively to so much unimpeded muscular contraction. Now Prof. Bain believes further that it is this mental capacity of feeling the putting forth of moving as well as resisting energy, and not any passive sensation, that gives us the consciousness of the object-world. In other words, it is through feelings of outgoing energy that Externality, and therewith all spatial attributes are constituted. Under this supposition it becomes obvious that "passive sensations" can only limit, and give concrete, experiential boundaries to the sweep of Externality created by "moving energy". The task of constituting an outspread sphere, which passive sensations thus experientially limit, devolves after all solely on motion. But motion, being "a fact of succession," has been declared by Prof. Bain himself incompetent even to suggest extension.

It would not be difficult, but useless, to trace a number of other incompatibilities in this typical and very careful specimen of a hybrid space-theory, half associational, half psychophysical. Vital spontaneity is indeed the fact of nature, by which our being is raised above the sphere of mechanical causation, within which we could, at best, be nothing but conscious automata. But this spontaneity is not to be found where Prof. Bain suspected it. It has been satisfactorily demonstrated by Profs. Ferrier and James that there exist no spontaneous centrifugal feelings initiating and regulating "moving energy". All the feelings we have when moving a limb unresisted from without are first sensations of resistances caused centripetally by the pull of muscles intra-organically hindered in their contraction, and then externally localised and subjectively qualified sensations shifting their position. The "moving energy" remains unfelt because muscles move by dint of their own *vis insita*. The mechanical effect, or outgoing energy of muscular motion, originates in the muscular substance itself, and no where else. Therefore the conscious result of its motion, felt by us as so much sweep or so much resistance, can reach us only centripetally. The neural process centrally initiating the inciting wave of molecular explosion that descends through the nerve-fibres to the muscles contains in itself nothing of motor impulse. Thus it comes that a volitional

resolution and its motor performance are so strangely incongruous to consciousness. The former is an immediately self-conscious activity; the latter comes back to the self-conscious centres as a mere inciting wave set going by, and organically representing a specific peripheral process.

In former sections it has been shown that sensations, being themselves immediately felt as localised affections, are possessed as such of the spatial attributes of position, involving definite distance and direction in relation to our apperceptive focus. As regards surface-extension, which is the spatial dimension especially held in view in the above and in most other attempts at space-construction, it is futile to try to argue away the conspicuous fact that tactile, as well as visual, sensations are themselves experienced as extended without the aid of any actual or remembered movement whatever. The series of subjective feelings accompanying the movement of a limb may measure well enough Extension already objectively subsisting, but it cannot create the permanent co-existence of its parts. An enduring and consolidated spatial integral can never result from a succession of lapsing moments. Space is no product of reconstitutive memory, but an original extensive feeling stimulated from a plurality of sensory elements, found objectively to co-exist as permanent possibilities of sensation.

Extension, actually subsisting as outspread room, is always more or less unconsciously presupposed by psychologists of the Association-school, and their "feelings of motion" only serve to measure this veritable space somehow found in readiness within perception. That a pre-existing matrix for the display of spatial phenomena is indispensable to constructive as well as to intuitive psychology, is rendered evident when we consider that motion itself, which really means the shifting from one place to another, if it is to come into consciousness as such, necessarily involves a plurality of positions one outside the other. The feelings of motion merely traverse as definite but continuously shifting positions a space otherwise objectively realised; or—contemplated from the subjective standpoint—they successively energise the permanent and co-existent parts of an organically pre-established disposition. To this invariable implication of ready-made space as room for the feelings to move in, or as extension to be measured by them, John Mill gives plain and strangely unguarded expression even while in the very act of defending against Intuitionists the psychological creation of space from successive feelings. He says that psychologists of the Association-school "con-

sider the idea of extended body to be that of a variety of resisting points, existing simultaneously, but which can be perceived by the same tactile organ only successively at the end of a series of muscular sensations, which constitutes their distance". As if "a variety of resisting points, existing simultaneously" were not already full-fledged objective space, merely to be measured by the successive muscular sensations!

To overcome the psychological difficulty of being obliged to transform a succession of unextended feelings into Extension, we have to make quite clear to ourselves that no sensation, whether motor or sensory, can possibly be felt as shifting its place, as moving in any direction, without energising different parts of our potential space-consciousness. If the feeling I have of my finger while holding it in a certain position, were spatially identical with the feeling I have in holding it in another position, the two feelings being distinguished only as having occurred in different moments of time, then never could I by any psychological means whatever realise these two feelings as external to each other, as separated one from the other by spatial distance. When I move a finger in non-resistant space, or along an object, it is not a succession of identical sensations I experience, but most distinctly a succession of different positions actuated within that potential sphere of space which radiates in all directions from my apperceptive focus.

Perhaps it may help to elucidate the fact that outwardness or distance from the focus of apperception is given in immediate feeling, if we consider such sensations as are usually believed to possess no space-attributes at all. We ask whether a sound, or an odour, or a taste is actually realised as a mere internal feeling, as a purely intensive affection of our apperceptive focus. It is evident, beyond doubt, that Externality, the most fundamental space-attribute, belongs to all of these mental states. They are unmistakably modes of the Object-world. It is the bell that sounds, the violet that is odoriferous, the wine that has the taste. Thus it also comes that these sensorial affections, when morbidly aroused by intra-organic stimulation, are so often turned by our productive imagination into externalised and objectified hallucinations. Experience may teach us more and more accurately what kind of object it is that arouses these sensations, or how near or how far from us the source of stimulation will be found, but the aroused sensations themselves are felt as immediately externalised experience, not as wholly unlocalised modifications of an

unextended self. Surely no one will seriously contend that it is experience which *originates* the outwardness of our sensations of sound, smell or taste, which gradually transforms them from mere internal affections into externalised feelings. Nor can any amount of listening, sniffing and smacking ever suffice to place the least distance between the percipient agent and his perceived sensations, or to separate by any fraction of space the locality of attention from the affections attended to. The peripheral organs, objectively perceived as situated at a distance from the centre of conscious realisation, have in the course of their organisation managed to make their existence and influences immediately felt where they can be actually corroborated by the objective aspect. Of course, all sensations alike are nevertheless at bottom only modifications of self-feeling, but self-feeling reaching to the stars.

It is indeed an inveterate and most obscuring habit of philosophy, dating from the very beginnings of rationalistic psychology, to look upon mental phenomena as purely intensive, containing "no elements of extension". Then inevitably we find ourselves in the presence of the most distracting crux of psychical science. Time has to be somehow metamorphosed into space, inwardness into outwardness. From a lapsing succession of sensations, forming a series of unextended feelings, the permanent and simultaneous expanse of the outer world has to be constructed. In this difficulty, arising from traditional assumptions involved in the spiritual hypothesis, Idealistic Experientialism, which endeavours to build up knowledge from a combination of sensorial awakenings, is forced to attribute all synthetical efficiency to an associating memory, to a psychical recollection and unification of lapsed data into actual mental presence. Memory spontaneously or associatively at work—these being mere empty words expressive of an unknown power operating in an unknown manner—memory as a reproductive power, itself hidden, has to furnish from sources utterly occult the synthetised product, which is recognised as ready-made in the unity of apperception. In order to accomplish this in our present instance of the conversion of temporal succession into spatial co-existence, the Association-philosophy has to transgress most anomalously its avowed laws and powers. It has not only to bring together previously and severally experienced data into actual mental connexion, but has moreover to create an entirely new product from the data experientially given. Sensations containing "no elements of extension" and muscular feelings

that cannot even "suggest" extension have, in the impenetrable recesses of associating memory, to undergo some miraculous chemical unification in order to appear in consciousness as that something called space, differing at least as much from moving energy and unextended sensations as the compound water is found to differ from its component elements.

But—it may legitimately be contended—if Extension or Space, after such an out-of-the-way mode of fabrication, actually appears at last in consciousness as a ready-made product of synthetic union, it cannot possibly be true—what however had been assumed to start with—that mental or conscious phenomena, occurring as they do without exception in time, are as such in truth one and all purely intensive or unextended. The fact is, the mysterious synthetising operation is not really meant to give birth to the transient phenomena of our own fitful space-consciousness, but efficiently to produce the objective extension of permanent existence; —an utterly hopeless undertaking. Our own sensations coexist, as such, externalised and extended. They do not merely realise or measure "a variety of resisting points, existing simultaneously".

I have been sitting quite motionless opposite a window, looking into vacant space, unconscious of any outward object. I now shut my eyes, and behold! the image of the entire window-frame appears most distinctly in perception. Will anyone maintain that this extended percept contains any "resisting points," or is produced by our memory recollecting into actual presence the moments of moving energy necessary to carry my focus of vision over all points of the seen surface, fusing them together with retinal sensations that through habit have been uniformly conjoined with such motion, and thus creating a definite idea of distance as separating the retinal sensations from each other?

If this astonishing performance on the part of synthetic memory should appear still plausible to anyone, let him try to explain what kind of new synthesis is accomplished by memory, when the whole after-image, steadily occupying identical retinal points, is felt to shift to new positions in space in agreement with every objective movement of the entire eye. Can it be that the very same retinal sensations have been habitually conjoined with every possible kind of muscular feeling? Would such a principle of arrangement not produce chaos instead of order?

Again I have my eyes closed, and hold my outstretched hand quietly before me. Distinctly and immediately I feel

it as an extended object, without shifting in the least my focus of apperception. Now, is this actual recognition of extension due to the remembrance of a number of previous tactile and visual explorations of the hand; or, on the contrary, to the simultaneous energising, at this very moment, of my potential space-perception from what can be objectively realised as a number of sensory points? It seems to me that to unprejudiced thinkers there can remain no doubt which of the two views is the more correct.

Apart from time-honoured misconceptions of a speculative order, peculiar psychological difficulties arise here principally from two causes. First, space is identified exclusively with surface-extension; the third dimension being at once abandoned to motor suggestions. And then this surface-extension is contemplated as primarily realised through motor explorations, through the actual movement of feeling points, such as the focus of vision or the tip of a finger over the explored surface. This view tacitly presupposes objective expanse, organic and extra-organic. Subjectively it renders indispensable to the construction of Extension a creative synthesis of successive feelings. As soon, however, as we realise that Externality and Extension are already given as definite distance in the immediately felt localisation of sensations, it cannot be difficult further to conceive that it is from a felt plurality of simultaneous sensorial positions, or from an extra-mentally accomplished combination and fusion of such, that surface-dimensions become consciously realised.

Mr. Herbert Spencer with his usual penetration has recognised that the veritable element of space-perception is position. He has even realised that these positions are all originally relative to our "centre of consciousness," and that in tactile experience they are in reality "perceived positions of that part of our body in which the sensation of touch is located". But, not following up to their veritable origin these perceived positions, he then yields to a psychophysical error, which vitiates his otherwise masterly analysis and synthesis of space. He believes the knowledge of the position of our members to be acquired by tactile explorations, missing thus the essential truth that this knowledge is given in immediate sensation, and that, consequently, distance or extension is primarily a truly subjective and not an objective experience. Hence by thus objectifying the knowledge of position as something connected with outer existents, explored and exploring, Mr. Herbert Spencer finds himself incapable of realising it without the help of motion. The knowledge of objective

position yielded by touch is gained through motion. Therefore motion, after all, must here also be the veritable creator of the space-attributes found in consciousness. Extension has thus to be mentally fabricated by a synthetic union of elements of succession. The fleeting contents of time have to be metamorphosed into steadfast spatial forms by obscure operations in latent mind. And as objective positions are all resistant to touch, the further task arises, to derive from the experience of such resistant positions the conception of a generality of non-resistant positions. Space, instead of being an underlying organic and vital potentiality energised by strictly localised sensations specifically stimulated, becomes a conceptual abstraction generalised from concrete tactile experiences.

My right hand is lying on my head; the other is outstretched on a table at my side. I have my eyes shut. Someone pricks my right hand. I immediately have a sensation localised at a definite spot above my apperceptive focus. Now my other hand is being pricked, and I am directly aware of a pain a long way off to my left at a certain distance below my apperceptive focus. After this, the person who applied the stimuli combines by means of a straight stick the two objective spots stimulated. I feel in consequence something touching the very spot first pricked and then something touching the pricked spot on the other hand. By means of feelings of resistance I conclude that a solid object has been placed between my two hands. Now, I ask, whether the knowledge of the direction and length of this foreign object be derived from the mental revival of the combination of tactile and muscular feelings required to carry an exploring finger or any other tactile organ over the space intervening between the two organic points here touched? Or whether that knowledge be not rather involved in the immediate subjective feeling of the positions occupied by those two points as already known before they had been objectively combined and measured by any foreign object? I think there can remain no doubt which of the two opinions is more in keeping with nature.

The leading misconception in Lotze's famous view of space-construction, a misconception shared by so many eminent scientists, consists in his hypostatising the nerve-system as a peculiar existent conveying spatially arranged impressions to a soul or mind which it has the power to affect. We have seen—as becomes so obvious when once pointed out—that what we objectively realise as the nerve-system is not an extra-mental existent at all, but a

percept in the mind of an observer. Such a nerve-system consisting in a percept of some other individual cannot possibly convey its spatial arrangements to the apperceptive principle belonging to the person observed. The notion of a soul apperceptively catching up nerve-motions or sensory impressions, however great a part it has hitherto played in philosophy, loses all its plausibility as soon as we come to understand that the physical aspect of our individuality is the perceptual realisation of an observer, and not the veritable substratum in which our own percipient principle is inherent, or with which it is in reality connected.

Under the false psychophysical supposition of a body acting upon a soul, the fictitious problem naturally arises: How sensory impressions simultaneously reaching such a soul, and on their passage from objective existence to subjective apperception losing all their spatial characteristics, can nevertheless so affect its purely intensive being as to force it to rearrange spatially its own sensorial awakenings. The realising soul being taken as an apperceptive subject to whom spatial attributes in no way apply, the task is imposed upon it to reconstruct spatial relations from mere qualitative data, which in some way it must receive from motor or sensory channels. These qualitative data are the celebrated and much utilised "local signs" introduced by Lotze. To us they are utterly useless, first because they owe their being to a fundamental psychophysical error, and then because—even granting the possibility of their existence—they could in no way help to originate our space-perception; for the most different spatial positions are, in fact, realised by identical sensory points, and this without the least reference to motion.

With Prof. Wundt I quite agree that we distinguish subjectively the various members of our body by means of a qualitative difference in the sensations emanating from their respective sensory surfaces; that, for instance, the immediate feeling I have of my foot is very distinctly distinguishable from the immediate feeling I have of my hand. But I deny that these qualitative distinctions assist in the production of space-perception, or afford any local signs for spatial arrangements. When I touch my foot with my hand, I feel both touching surfaces localised at the very same place in space. Here the two qualitatively different sets of sensation occupy the same spatial positions. The recognition of these positions can therefore not be helped or hindered by the peculiar qualitative characteristics of the sensations, which make me aware that it is a

certain hand and a certain foot, and no other member of my body, that are thus localised. I now feel my thumb in some definite place in space: I know that it is my thumb by dint of the peculiar quality of the sensorial awakenings emanating from it. Has this qualitative peculiarity been operative in the recognition of the spatial disposition of the feeling? To decide this question, I move my thumb to quite another place. The qualitative peculiarity of the feeling remains unchanged; yet I clearly recognise that it occupies an entirely different position in space. Consequently the qualitative peculiarity of the feeling cannot possibly have contributed anything to the space-perception here involved. And if I recognise the position of any one point of a member without the help of qualitative signs, I certainly recognise as well the position of all its points without such help.

The feelings of motion or innervation which—synthetically combined with such qualitative tactile characteristics—are held by Prof. Wundt to constitute space, I have shown to take no part in our original realisation of spatial dimensions. Therefore both synthetical factors of Prof. Wundt's space-construction are ineffective.

In studying the history of the space-problem, as far as the material for such study has been accessible to me at my distant home, I am highly gratified to find that at least one investigator, starting from the much more obscure and difficult phenomena of sight, has nevertheless arrived at an essentially similar conclusion to the one I have reached by the psychophysical interpretation of a distinct and simple tactile experience. Prof. Stumpf, in his very able and elaborate treatise *Ueber den psychologischen Ursprung der Raumvorstellung*, has demonstrated that extension together with colour form part-contents of one and the same sensorial experience, and that this experience is immediately given without the help of muscular motion; not associatively or synthetically constructed with the aid of such. He also shows that the third dimension, distance or depth, usually attributed to the influence of motor realisations, is immediately recognised as forming part of our original sensorial experience; in fact that every spatial recognition involves all three dimensions.

(To be concluded.)

V.—RESEARCH.

ON THE TEMPERATURE-SENSE.

By Henry Herbert Donaldson,

Psychophysical Laboratory, Johns Hopkins University, Baltimore.

1. *Historical.*

In the course of an investigation undertaken with Prof. G. Stanley Hall and under his direction, it was incidentally observed that the sensation of cold was felt only at definite spots on the skin.

The fact was noticed in this way: The sensations of motion as derived from the skin were being studied by means of a metal point which was slowly drawn over the surface. When the motion of this point, which was controlled by a suitable apparatus, was very slow, it often happened that it seemed to stand still for a time or even be lost, when suddenly a sharp sensation of cold, distinctly localised, would recall its presence and position.

This occurred so often that I find in my protocol for April 18th, 1884, the note: "Point always felt as cold". This fact arrested my attention, and in connexion with the other work I made several maps of these cold-spots on different parts of the body. When the experiments had reached this point, an important paper by Magnus Blix (1)[1] came into my hands.

This investigator started from the law of the specific energies of nerves, and took up the study of the dermal sensations to determine, if possible, how well-founded was the contradiction which they apparently offered to this law. He employed unipolar electrical stimulation, using a pin for his small electrode, and made use of an induction-current so weak that it did not generally cause pain. He thus produced at one spot on the skin a sensation of pain, at another pressure, at a third cold, and at a fourth heat. These spots were distinctly localised, and never superposed on one another. He gave special attention to the spots from which sensations of temperature were to be obtained. These he studied by means of a small metal tube drawn out to a conical point (Fig. III., below), and so arranged that a current of water could be kept flowing through it, thus enabling the observer to maintain the point at an approximately constant temperature. Using this instrument, he investigated various parts of the skin, and mapped out the heat-spots and cold-spots in several regions. Further, he applied the crucial test: a heat-spot and a cold-spot having been found, the warmed point was applied to both, then the cold. No sensation followed the application of the warmed

[1] See "References to Literature" at the end.

point to the cold-spot, or the cold point to the heat-spot; thus showing the complete differentiation of these temperature-organs.

Where the epidermis is thicker, he found that the stimulus must be stronger to get the desired reaction. This suggests that the so-called spots may only be the more superficial portions of the nerve-bearing layer of the skin, which is in reality all sensitive. That this is not the case, is shown by the fact that the stimulus may be applied to a neutral spot for an unlimited time, without giving rise to a thermal sensation. The general bearing of these results on the current theories is kept in view throughout the paper. Blix, therefore, concluded that we have separate nerves for heat and cold, and that these have distinct terminations in the skin, which can be demonstrated.

Somewhat after the appearance of this paper by Blix, A. Goldscheider (2) published the results of a very important series of experiments.[1] He had been for some time studying the specific energies of nerves, and in this connexion was led to investigate the sensations of temperature. For detecting the cold-spots he used either fine brushes dipped in ether or capillary tubes filled with the same. For locating both the heat-spots and the cold-spots he used small brass tubes brought to a conical point at one end and closed by a rubber-stopper at the other; these could be heated or cooled as was desired. To exactly mark the spots when found, he used a thermæsthesiograph, by means of which a brush wet with Indian ink could be brought down quite exactly on the spot which had been previously stimulated. I regret, however, that he has given no account of precisely how he travelled over the skin with this apparatus, and thus developed his maps. Thus working, he found that temperature-sensations were roused only at definite spots. His maps show them as very much more abundant than either Blix or I found them.

As a rule the cold-spots are most abundant where the skin is most sensitive to cold, but what Goldscheider calls first-class spots, *i.e.*, those which react strongly on moderate stimulation, may often be quite few in number, where the spots of all grades are numerous.

These spots are not alike on the symmetrical parts of the same individual, nor are they alike on the corresponding parts of diffe-

[1] At this point explanation becomes unavoidable. I first learned of Goldscheider's work on this subject, through *Nature* for January 15th, 1885, which contained an abstract of a report made to the Physiological Society of Berlin on December 12th, 1884, by Prof. Eulenberg. In this abstract, mention is made of the work of both Blix and Goldscheider, but no mention of the place of publication. This was first discovered on March 13th, 1885, and on the following day I was able to consult the paper at the office of the Surgeon-General at Washington. At another point I shall state how much of my investigation is strictly independent, and how much is imitation of the work of the above authors. The mention of these dates, however, appeared to me necessary to prevent any misapprehension of the relation in which the various investigations stand to one another.

rent individuals. What has been said for the cold-spots holds true also for the heat-spots. These latter are on the whole less abundant than the former, and tend somewhat to occupy the spaces from which the former are absent. There are certain spots which are roused only by excessive temperatures. Goldscheider notes also that a spot often stimulated loses its sensibility, apparently becoming exhausted, for it does not react well until a more or less long period of rest has been allowed. When a heat-spot is overheated, it sometimes happens that a hyperæsthesia is produced, so that even pressure from a perfectly neutral body gives rise to a sensation of heat. He calls attention to the often observed fact that the tactile and thermal sensibilities in different parts of the body do not vary uniformly, and he points out that the discriminative sensibility when measured on two thermal spots is, as a rule, much finer than when measured in the ordinary way, and that this discrimination is finer the more intense the stimulus. In certain parts, as, for instance, those in which it is finest, discrimination for tactile-sensations surpasses that for temperature-sensations.

These sensations of temperature can be roused by mechanical and electrical stimulation as well as thermal. In both cases the cold-spots are more easily discriminated than the heat-spots.

By sending a strong electrical current through the arm and parts of the hand and thus stimulating certain nerve-trunks, Goldscheider is able to get peripheral sensations of temperature; here, too, the sensations of cold tend to predominate. He finds these spots insensitive to pain or contact. A needle may be plunged into them, or excessive temperatures applied without causing any feelings of discomfort.

Goldscheider also mentions the commonly observed persistence of sensations after the removal of the stimulus.

In sketching a general theory of temperature-sensations, Goldscheider brings a certain amount of evidence against the views of Hering (15). This latter investigator, relying mainly on the fact that water of the same temperature may feel cold or warm according as the hand is brought into it from a warmer or a colder vessel, concluded that, when the susceptibility of the thermal apparatus is decreased from one kind of stimulus, *e.g.*, heat, it is increased for the other, *e.g.*, cold, and *vice versâ*. The experiment which Goldscheider records is this: If one hand be put into a vessel of water at 40° C. and kept there for ten seconds, and if then both this hand and the one which during the meantime has been at the room-temperature be put into cold water, the warmed hand will feel the cold less distinctly than the one which has been kept in the air of the room. In going from a cold vessel to a hot one, heat is in the same way less distinctly felt by the hand which has been immersed. If, now, the view of Hering were correct, that the exhaustion for one stimulus was correlated with an increased sensitiveness to the other, we should expect the

immersed hand to feel the change of temperature more acutely than the other; but this, we have seen, it does not do. Goldscheider therefore inclines to the older view of Weber.

Goldscheider's paper is further continued by an interesting discussion of the other sensations of the skin—pressure, pain and tickling; but with those we are not at present concerned.

In a communication to the Physiological Society at Berlin (Dec. 15th, 1884), Prof. Eulenberg (3) states that he has been able, in the main, to corroborate the results of Blix and Goldscheider, but did not succeed in getting temperature-sensations by mechanical stimulation. In Eulenberg's paper, chemical stimulation is spoken of as having given positive results in Goldscheider's hands. As no mention is made of chemical stimulation in any of the published papers of Goldscheider which I have seen, I am inclined to think this statement erroneous.

The most recent paper is a note by Goldscheider (4) in which he reaches the conclusion that the temperature-nerves often radiate from centres, and that these centres often coincide with the hair-follicles.

2. *Experimental.*

As the work which had been in progress before the receipt of Blix's paper involved the use of metal points at the temperature of the room, it naturally followed that the cold-spots were alone noticed. The moment attention was directed to the heat-spots their existence was easily demonstrated.

My first endeavour was to make an accurate map of these spots on some portion of the skin. Maps had been made long before, but they had been quite rough, and hence it was deemed worth while to repeat the operation. For this purpose, the apparatus which had been previously in use was, with some slight modifications, employed. This machine was devised by Prof. Stanley Hall, and will be described in a forthcoming paper, under the name of the "Kinesimeter". The description about to be given is intended to make clear the use of this instrument in this investigation alone.

The essential part is a rectangular brass table T (Fig. I.), 36 × 33·5 cms. and 26·5 cms. high, supported on four legs. In the middle of this is a rectangular opening 25 × 5 cms.; over this runs the car R, the wheels of which fit into grooves on either side of the opening. It can thus be rolled from one end of the opening to the other. At the ends of the opening are seen the grooved wheels P′ and P″, about which passes the endless cord N N. This cord can be clamped to the side of the car, so that when the wheels are put in motion the car is moved. P″ is geared with P so that the motion of P is transmitted to it; in this way, by putting my finger on P and slowly turning it, a slow motion can be given to the car.

FIG. I.

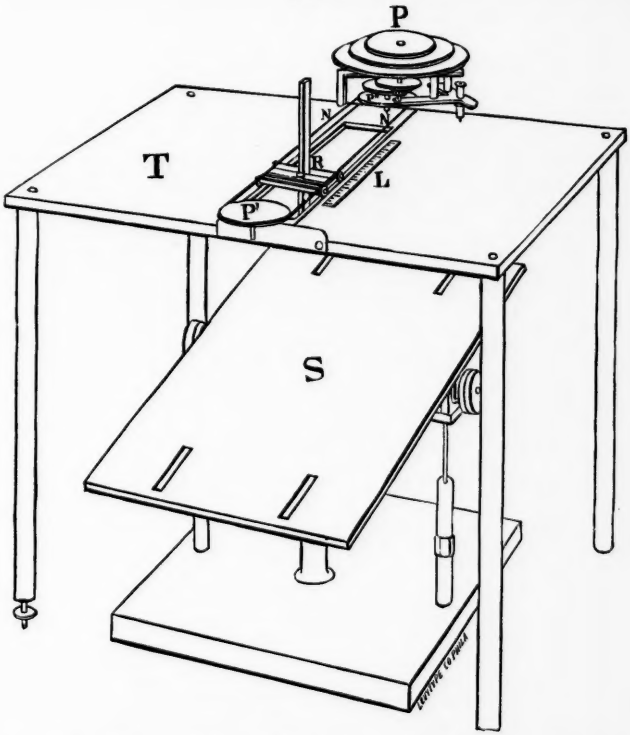

FIG. I.—The Kinesimeter (size $\frac{1}{3}$ the original). T, Table; R, Car; N N, Endless cord; P, P', P'', Grooved wheels; L, Scale; S, Adjustible support.

The car itself (Fig. II.) has the following construction. It consists of a square brass frame, 6 × 6 cms., supported on four wheels. Joining the two sides of the frame are two cross-pieces K, K', having between them a space 1 cm. wide. Within this space, and sliding by grooves along the cross-pieces K, K' is a cubical block of brass (not shown in the figure), which can thus be moved from one side of the car to the other through a distance of 4 cms. The upper side of K is marked off into millimetres, and the sliding block has on it an index; by this means the position of the block can be exactly determined. By means of the screw V, the grooves in K' can be narrowed and the cubical block thus clamped in any position desired. Through the centre

FIG. II.

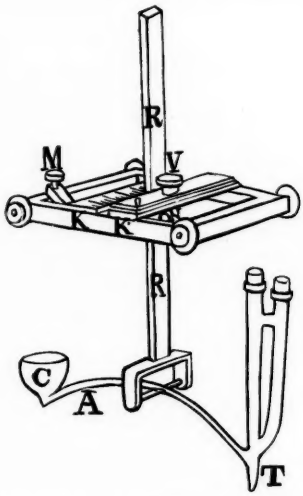

FIG. III.

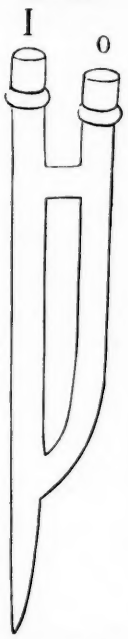

FIG. II.—Car (size ½). R R, Adjustible rod; A, Swinging arm; C, Counterpoise cup; T, Hollow tube (rubber tubing and flasks for keeping a continuous stream of water flowing through the tube—not shown). N, Clamping screw to hold R R in position; K, Cross piece with scale; K', Cross-piece, the groove of which can be narrowed; V, Clamping screw by which the narrowing is effected; M, Clamp for fastening the endless cord to the car.

FIG. III.—Hollow pointed tube (actual size). I, Inflow; O, Outflow (after Blix).

of the block runs the vertical rod R R, 10 cms. long, and rectangular in cross-section. This rod can be moved up and down, and fixed at any height by the clamping screw N (partly shown in the figure). The lower end of the rod bears the curved arm A, 8 cms. long, which swings vertically. At one end is the cup for holding a counterpoise weight; at the other the pointed tube is soldered (Fig. III.).

In Fig. I. is to be seen the support S. This is a heavy brass platform, the height and inclination of which can be adjusted within wide limits: when experimenting, a wooden trough was lashed to the top of this plate S, and in this trough the limb, supported at the sides by soft cloths, rested. Thus slight movements of the limb were prevented, and the whole plate could then be raised to the requisite height, and levelled for the experiment.

It remains to describe the device for applying the thermal stimulus to the skin. This was copied, in the later work, directly

from Blix. A German silver tube (Fig. III.) was made in a way which is plain from the figure. Water of the requisite temperature was allowed to flow through it, entering by the straight limb, and by this means any temperature could be maintained throughout the experiment. The point of this tube which is applied to the skin, is 0·9 mm. in diameter and rounded.

The part to be examined having been adjusted on the platform S as described (Fig. I.), the car was moved along until the point of the tube was brought to rest on the desired spot. Then, supposing the portion of skin to be examined to be 2 × 3 cms., by means of the gearing above described the car was made to move over the skin in a straight line and at a slow and uniform rate; the point pressing down with a weight of about 10 grms. The distance of 3 cms. having been thus traversed, the point is raised and the car rolled back to the place from which it started. Now by means of the block which carries the rod R R (Fig. II.) the point is moved 1 mm. laterally, and the same thing repeated. Thus, in mapping out a space 2 × 3 cms., the car is drawn 21 times over the skin, making 21 parallel lines or practically touching every bit of skin within the area. The fact that the point is ·9 mm. in diameter and is moved 1 mm. each time, is not inconsistent with the above statement, for the sinking-in of the skin under the point brings practically a millimetre of surface in contact with the point on each tip.

For the purpose of making it possible to continue such observations for a number of days, the hand or other part of the body was marked. To do this a point was located in the back of the hand, for instance, by very careful measurements which could be repeated at any time. In a line at right angles to the long axis of the hand, another point was marked; then in a line at right angles to the line joining these two parts, a third point was placed a few centimetres distally.

Starting from the first-mentioned point, a series of very fine dots was placed along the transverse line at each millimetre. There was thus formed a line of 21 dots along the distance of 2 cms.

The hand was adjusted so that the lines drawn by the thermal point coincided with, or were parallel to, the line at right angles to this row of dots; by means of this device it was possible to arrest an experiment at any time, and take it up again from the exact point at which it had been stopped.

The marking the skin was done with a fine brush dipped in an indelible ink. The permanency of this marking material was its main recommendation; at the same time, it may not be out of place to draw attention to the fact that the slight inflammation caused by the silver nitrate renders it unsuitable for marking the temperature-spots themselves.

The position of the spots at which heat or cold was felt, was recorded in the following way. On the car was a fine index

which moved over the millimetre scale L (Fig. I.) as the car was drawn along. The index moved 1 mm. for each mm. of skin over which the point passed, so that, if the position of the index was observed at the start, the distance through which the point had moved on the surface could at any time be readily found. Fifths of a millimetre could be read on the scale, so that the position of the point could be accurately recorded. In practice then the position of the index was noted when the point was on one of the dots on the hand. As the car moved on and a spot at which the temperature was felt was crossed, the person examined called "hot" or "cold" and the experimenter noted the position of the index. After the experiment, the positions of the spots were all calculated from these notes and recorded on paper ruled in squares on which 1 mm. was represented by 5 mms., thus enlarging the area twenty-five times. By this means, the small differences in the positions of spots could be recorded without confusion. The maps to be presented were made in this way, and then reduced to their true size, the points occurring within ·5 mm. being in these maps united into a single point.

There is of course the possible source of error that, where the surface is rough, 1 mm. on the scale will not represent 1 mm. on the skin. This has been attended to, and though it prevents the use of this method of experiment on certain parts, it does not become of any importance in the maps given.

There is another error which should be noted. The points being ·9 mm. wide, the lateral position of a spot is in doubt by ·45 mm. All the spots are put down in the middle of the path of the point and are thus so far inexact. The relations of the spots are, I think, even under these conditions, pretty fairly represented. A number of preliminary experiments were made to see if any important variation was caused by varying the direction in which the point was drawn: the results were found the same, whether the motion was up or down the limb or transversely, so that in the later experiments it was always drawn in one direction only. There is a slight variation caused by the movement of the skin itself under the point, especially at those places where the skin is loose; but where the movement is always in the same direction, this disturbing factor is reduced to zero.

Two carefully constructed maps are given (Figs. IV. and V.) for the left and right hands of the same individual, the parts being symmetrical. In this case the cold-spots are marked with dots and the heat-spots with circles; the difference in size indicates a difference in the intensity and regularity with which the sensation could be obtained from the different spots, the smaller spots being less sensitive.

In this work the temperature of the point used for finding the spots at which cold was felt, was about 15° C., while that for the heat-spots was about 50° C. In the study of the spots on other parts of the skin, the metal tube of Blix was often held in the

hand and thus moved about, this method answering for certain work very well. The other apparatus used will be described further on.

FIG. IV.

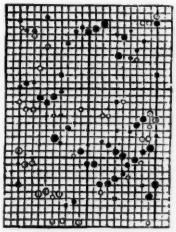

FIG. V.

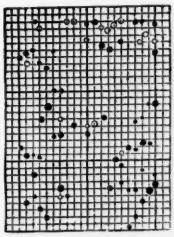

FIG. IV.—Map of the heat-spots and cold-spots on the back of the left hand. Extent, 2 × 3 cms. Dots indicate cold; circles, heat; the larger ones represent the spots which give a strong reaction; the smaller, those which give a weak one. The top of the map is peripheral, the bottom central. The right side is the radial; the left the ulnar.

FIG. V.—Similar map for the symmetrical portion of the right hand of the same individual. In this case, of course, the left side is the radial, and the right the ulnar.

In the statement of results it will be necessary to give them in chronological order to show how far they were independent. When first experimenting, a cold brass point, 1·5 mms. in diameter, was the only instrument used. With this I had found that cold was felt in spots, some spots giving an intense sensation, others a weak one; that the skin between these spots was not sensitive to cold; that the points were differently distributed in different parts of the same individual, and in similar parts of different individuals; that they were very small—as shown by the fact that unless a spot was carefully marked it could not be easily found again, for passing the point even very close to it did not rouse a sensation, as a rule; that they were permanent—once having been found they always could be found again; that they were easily exhausted—this being shown by the fact that, when the metal point was drawn down the arm and a certain number of points were observed, if it was again drawn down immediately, the number noticed on the second trip was almost always less than on the first, but if some minutes were allowed to elapse between the two trips, then the second result was, as a rule, like the first.

When I had gone thus far, Blix's paper was received. Blix (1), besides noting all the points above mentioned, found similar spots for heat, and found that what was true of the cold-spots was true of the heat-spots also, so far as their arrangement and distribution were concerned. He noticed also that the arrangement on symmetrical parts was not symmetrical; that the rela-

tive abundance of the two sorts of spots varied; that the heat-spots were rather less numerous; and that the two kinds were always distinct; further, he succeeded in getting them to react not only to thermal but also to electrical stimulation.

It was a simple matter to confirm Blix's observations on the heat-spots, and also his other observations on the temperature-sense. For this purpose the modification of the Kinesimeter already described was used. With regard to electrical stimulation there is something more to be said. Using unipolar stimulation, with a pin for the small electrode, the sensation of cold came out very plainly at certain spots, while the sensation of heat was by no means so clear, as it seemed to me, and tended strongly to go over into burning pain which was almost unbearable. There were also other spots at which the electrode caused a burning pain from the first. Wishing to try the effects of altering the temperature of the electrode, I fastened one wire of the secondary coil to my hollow tube (Fig. III.), and, using that, was thus enabled to have my electrode at any desired temperature. The experiment was planned as follows. A heat-spot and a cold-spot were marked, then the electrode was cooled to 15° C., and by it a weak current was sent through the spots. The sensations of heat and cold followed, as was expected. The temperature was then raised to about 30° C., and again the current was applied. A sensation of heat was obtained at the proper point, but none of cold. So when the temperature was raised higher, the application of the current to the cold-spot gave no thermal sensation at all. Just what the meaning of this curious reaction is, I am not prepared to say; but my experiments on this subject are very concordant. These observations, taken in connexion with the fact that it is not very easy to get a good clear sensation of heat by electrical stimulation, indicate that further work is wanted here.

After the observations of Blix were thus corroborated, I continued the work in hopes of being able still to add something to the information already collected.

The investigation has proceeded on the assumption that these organs for heat and cold were in the skin. This idea is supported by the fact that a localised spot sensitive to temperature moves about as the skin is moved, and, when the skin is raised, comes up with it. If then the organs are in the skin, it should be possible to cut them out and examine them histologically.

A cold-spot and a heat-spot were localised on my own skin, and then cut out for me by Dr. Councilman. The bits of skin, about 3 mms. in diameter and the same in thickness, were treated by the gold chloride and formic acid method of Ranvier, hardened in alcohol, cut into serial sections perpendicular to the surface of the skin, and mounted in glycerine. For sectioning and mounting these specimens, I am indebted to Mr. H. F. Nachtrieb.

They had been marked with small dots of indelible ink, and the

sections showed beneath the marking a slight inflammation. No difference could be made out between the spot at which cold had been felt and that at which heat was observed. There were numerous nerves beneath these spots, but they were almost as numerous in neighbouring parts. The result of the histological investigation then is so far completely negative. The cold-spot, it should be added, was taken from the middle of the lower leg on the anterior surface, while the heat-spot came from the middle of the volar surface of the forearm.

Thinking from this that the organs for the sensations of heat and cold might be quite independent of the papillary layer, I examined scars both on myself and others about the Laboratory. I also took the opportunity to examine some on patients at the Bay View Asylum. For this privilege I am indebted to Dr. Jones, the resident physician.

In the case of a woman with extensive burns (accident took place eighteen months ago), a large one on the arm, which had quite healed without much contraction, was very sensitive both to heat and cold. The point felt hotter on the scar than on the sound skin.

On the other arm the burn, in healing, had quite drawn together, and the bands of connective tissue beneath made the surface irregular. Here also both heat and cold were felt in spots, but were more intense on the superficial than on the deep parts of the scar.

In the case of a man who had two scars on his legs, consequent on deep incisions made some two years ago, the same sensitiveness was found, except for a line in the centre, about 3 mms. wide, where the scar was quite insensitive to contact, as well as to temperature. This line marked the place at which the incision had been made. For a little distance on either side of the line the point (either hot or cold) often gave rise to a pricking sensation. I later found the same pricking sensation from thermal stimulation of a large scar from a knife-wound on my own wrist made twenty years ago. Scars from boils are sensitive to temperature; and one case examined, in which the skin had been mechanically torn away for a space about 1 × 3 cms., and which was now healed, was exquisitely sensitive both to heat and cold.

It may further be added that the places on my own skin, from which the spots were removed, are now healed, 31 days having elapsed since excision, and are, so far as I can tell, as markedly sensitive to heat and cold respectively as they were before operation. I am aware that these observations do not accord with those of Weber (5). If I understand the statements of the facts as given by Weber, his experiments were made on wounds that had already healed, and therefore similar to those on which I have above reported. He found that a spatula at 8·7°-12·5° C. was not clearly distinguished from one at 45°-50° C., when applied to surfaces like burns on which the skin had been destroyed.

The patients answered the question "hot" or "cold" as often wrongly as rightly, and occasionally, for three successive times, called the hot spatula cold, while on the uninjured part of the skin they could easily discriminate between them The temperatures which I used were 12°-16° C. for cold, and 50°-55° C. for heat; but the application was made with a point only ·9 mm. in diameter. The reason for the different results is, I think, this: When Weber rested his spatula on a thermally sensitive spot, the patient reacted correctly; but when it was between such spots, the patient had no thermal sensation and was forced to guess. That it is possible to find these thermally insensitive regions is pointed out by Blix and confirmed by my own experience. That they are sometimes quite large, even on sensitive parts, is plain from Figs. IV. and V.; and furthermore I have noticed that on many scars the spots for the above temperatures were less abundant than on the sound skin. Finally I also found regions on the scars which were thermally insensitive, so that a spatula applied to them would have given the patient no idea of its temperature. This is to my mind the probable explanation of the contradiction here.

Later, Weber (5) did make some observations on a fresh wound, from which the skin had been removed by a burn, and found it insensible to temperature-changes; but he did not study the regeneration of these nerves during the process of healing. Lussana (6) has lately examined the scar of a burn in the case of a woman, the injury having occurred thirty-five years before the examination. Here the injury was very deep, and the extent some 10 × 12 cms. He states that in the region injured the temperature-sensibility is diminished, and concludes from this that this sensation is more delicate in the papillary layer than in the tissues beneath.

In this connexion it may be mentioned that, contrary to the explicit statement of Weber (5), I find the œsophagus, through its entire length, sensitive to temperature, both in myself and in a number of others. Some individuals do not distinguish clearly the temperature of a body in the œsophagus, but I have not found them as numerous as those that do. In one individual who was subject to certain dyspeptic attacks, accompanied by eructations, the temperature-sense in the œsophagus was apparently increased during the attacks. The tests were made with cold and hot water, at a temperature of 4° C. and about 50° C. The passage of the substance can, in my own case, be distinctly traced from one end of the œsophagus to the other, as a sensation of heat or cold. On entering the stomach, a slight sensation is felt, but this is by no means so clear as that from the œsophagus.

The usual statement of the parts endowed with temperature-sensations does not include the conjunctiva, but this is really quite sensitive.

From all this, it follows that the end-organs for the sensation

of temperature will have to be found in the œsophagus and conjunctiva, as well as in the places usually named.

The observations can be summed up as follows :—

The parts covered by skin have the temperature-organs in the skin. When the surfaces beneath the skin are tested, they are found insensitive to temperature.

The papillary layer is not necessary for temperature-sensations.

The nerves are generally regenerated in the healing of burns and other scars, except in certain places where the connective tissue is very dense.

To test the sensitiveness of these heat-spots to radiant energy, an apparatus was used, which was essentially like that described by Pollitzer (7). It consisted of a Paguelin's thermocautery, which could be brought to bear over a hole in a thermally opaque diaphragm. The skin to be examined being brought beneath the hole, at a given instant the hole was uncovered and the heat fell on the skin beneath. The time which elapsed before the individual felt heat was recorded. In this case it was permissible to use the time as the measure of sensitiveness, for within the region experimented on the thickness of the epidermis was practically constant. Moreover, testing the various distances at which the glowing point was just perceived, gave similar results. By thermal stimulation cold, heat, and neutral spots were carefully located on the skin, and then marked. The patient was ignorant as to which was to be exposed. The glowing point was fixed at a constant height, the skin uncovered at a given signal, and the patient reacted to his first sensation. This was repeated three times for each spot in every experiment. The circle of skin exposed was 2 mms. in diameter. A typical series of results is given :

On J. V. D., March 10th, 1885.

Distance of point in mms.	Spot.	Time in seconds.	Character of sensations.
8	Heat-	3	Strong.
8	Cold-	25	Very slightest.
8	Neutral	30	No sensation.
8	Neutral	30	No sensation.
8	Heat-	3	Strong.
8	Cold-	16	Very slightest.
8	Cold-	40	No reaction.
8	Neutral	30	A mere breath.
8	Heat-	16	Strong.

It will be noticed here that sometimes a sensation of heat is recorded for other than heat-spots. In some cases it is, I think, simply an error of experiment, as in the sixth observation in the table above, where I presume a slight displacement of the hand exposed the edge of a heat-spot and thus gave a sensation. The very faint reaction sometimes obtained at points which gave no

reaction on ordinary stimulation with a warmed point is, I think, due to spots sensitive to heat but brought into action at a comparatively high temperature only.

It is to be mentioned, however, that these faint sensations were never distinctly localised, while the strong sensations which followed the stimulations of a heat-spot were very sharply localised indeed.

An attempt was made to test the cold-spots by the same method, but it did not succeed, it not being possible to get a low enough degree of temperature to give a good working-distance for the apparatus. It was of course noticed with these spots, as with the whole skin, that the thermal sensation when roused lasted some time after the removal of the stimulus, in some cases several minutes. This is often a disturbing element in certain experiments, for it is not always clear whether a given sensation comes from the spot at which the stimulus is acting, or from the spot at which it just acted. It is this fact which contributes largely to the continuity of the sensation of temperature when a stimulating body is drawn over the surface of the skin.

Having done this much on the subject, I received Goldscheider's (2) account of his own researches. The new points in his paper bearing on heat-sensation were—the number of spots found; their distribution; mechanical stimulation; their insensibility to pressure or pain; temperature-sensations from stimulation of nerve-trunks; and the increased discriminative sensibility on these spots.

In his maps the points are represented as much more numerous than they are in those presented by either Blix or myself. This is without doubt due to the fact that more intense stimuli, both for heat and cold, were used by Goldscheider than by either of us. His method was practically the same as that of Blix. Regarding the arrangement of these spots, both for temperature and pressure, his latest view is that they lie in lines radiating from centres, that these centres often coincide with the hairs in the hairy portions of the skin, and that in the hairless parts the arrangement is apparently the same. This statement I have not yet tested. He points out that these spots for both heat and cold can be roused by mechanical stimulation; a slight tapping over the surface where a temperature-spot is located giving rise to the sensations of heat or cold, the latter responding the more readily of the two. These experiments I have repeated, and the results are certainly very striking. Puncturing a temperature-spot also gives rise to temperature-sensations.

Moreover, he points out that these spots are insensible to pain or pressure. Repeating these experiments, I find complete analgesia in these spots, for a needle can be run into them without giving the slightest sensation of pain; but at the same time I have not been able to satisfy myself that I do not feel pressure.

In certain cases Goldscheider succeeded in getting sensation of temperature by electrical stimulation of the nerve-trunks in the arm, back of the hand, &c.

These observations I have also repeated, using very strong electrical currents which gave almost continuous pain, as recommended by Goldscheider. By stimulating nerves in the back of the hand, I have succeeded in getting peripheral sensations of both heat and cold, the latter sensation being the more frequent. The sensation was localised in small areas in all the cases which I observed.

I am able also to corroborate his statement that the discriminative sensibility is much finer for temperature than for tactile sensations.

Since the receipt of Goldscheider's paper, I have been able to make one independent contribution to this subject, which, so far as I am aware, is new.

Dr. M. Warfield called my attention, a short time since, to the fact that in a certain operation on the eye by Dr. Russell Murdoch, cocaine having been used, the patient recognised the presence of the knife on the eye by a sensation of cold. By the courtesy of Dr. Murdoch, I was enabled to examine the eyes of several patients at the Baltimore Eye and Ear Hospital. When the eye in these cases was completely insensible to pain, and felt no contact whatever, cold and warm bodies were readily distinguished. This observation I have been able to repeat on my own eye. By means of 5 per cent. solution of muriate of cocaine the eye was rendered completely insensitive to pain or contact, but still readily felt heat and cold.[1] Here we have the

[1] At the end of a brief account of this action of cocaine, published in the *Maryland Medical Journal*, I requested observations on the temperature-sense by those who had occasion to use cocaine in the throat. Dr. John N. Mackenzie at once took up the matter, and has kindly furnished me the following summary of his results :—

"Six patients were taken for experiment. The uvula and soft palate, and afterwards the nasal passages, were first bathed in a 4 per cent. solution of the muriate of cocaine. When anæsthesia of the parts was complete, a silver probe, which had been previously immersed in a mixture of ice and salt, was carried over the parts, rendered beforehand insensible to contact and pain, as tested in various ways. A distinct sensation of cold was in every instance complained of.

"The opposite extremities of the same probe were next heated over the argand burner of a lamp used for laryngoscopic purposes, and in its heated condition made to impinge upon various spots in the anæsthetised area. While absolutely no pain was felt by any of those experimented upon, there was a marked unanimity of the answers in regard to the sensation of heat. In three of the cases, the application of the heated probe left an eschar, and in one a pretty severe pharyngitis developed, yet at the time of application no pain was felt, though the temperature-sense remained intact. None of the patients were aware of the purpose of the experiments or the previous preparation of the probe."

temperature-sensations completely isolated from the other dermal sensations in a way which is now capable of easy repetition, and important as furnishing another argument for the independence of the thermal apparatus.

3. *Theoretical.*

The wider bearings of these results have been insisted on by both Blix and Goldscheider, but it may not be amiss to call attention to them here. The view of Weber (5), that we have but a single apparatus for both pressure and temperature, was mainly based on the fact that he did not succeed it separating the spots on the skin from which the two sensations were roused, and that a cold body felt heavier, a warm one lighter, than one at the temperature of the skin. But Szabadföldi (8), using disks of wood heated to 50° C. and above, found that warm bodies were felt heavier than those not warmed, so that the force of the latter argument is much weakened.

Wunderli's (9) experiments showed that at obtuse points, as on the back, a touch with cotton wool and the approach of a warm body were sometimes confounded. If these experiments are taken to show a common origin for temperature and sensation of pressure, which by no means they do, then, as Blix points out, we must admit that heat, cold, and pressure of a certain grade are all identical, an idea which is absurd.

Against the view of Weber, there was, from the start, the objection that the temperature-sensations and discriminative sensibility did not vary *pari passu*, as might have been expected from his theory.

Further, there is the pathological evidence.

Brown-Séquard (10), and also other observers, have noticed that, in certain cases where the sensibility of the skin is abnormal, the pressure-sense and temperature-sense are not equally affected; in fact, in some cases one may entirely disappear and the other remain intact. Evidence has also been brought forward to show that these two sensations pursue different paths in the cord.

Recently Adamkiewicz (11) has called attention to the fact that a sinapism has a different effect on temperature and tactile sensibility, for the sinapism causes no effects of transfer for temperature, while it does for the tactile sensations.

Herzen (12) has found that when the arm is made to fall "asleep" tactile sensibility is first abolished, then sensibility to pain; with the former the sensibility to cold disappears, while that for heat remains and does not disappear until the arm becomes insensitive to pain. Testing the rapidity of the transmission for the sensations of heat and cold, he found that the relative rapidity was as 3 to 2. He adds the clinical fact of a woman who had no sensation of temperature from bodies below

27° C. In this case the *post-mortem* showed the posterior columns of the cord in an atrophied condition. He suggests then that the sensations of cold and pressure pass through the posterior columns, while heat and painful sensations are transmitted by the grey matter.

As bearing directly on this question, the action of cocaine above described may be referred to.

Brücke (13) has called attention to the fact that in some cases we get different reflexes according as pressure or thermal stimulus is used.

The recent writers, Funke (14), Hering (15), and others, have assumed a special apparatus for the temperature-sensations on account of the distinct modality of the two sensations. So far as I know, the observations of Herzen (12), mentioned above, are the most important evidence for the duality of the temperature-sense itself.

Previously, there were various theories current as to how one apparatus could give rise to two sensations as clearly distinct as those of heat and cold.

Weber (5) put forward the view that it was the act of rising or falling in temperature which roused the thermal sensations. Vierordt (16) explained it as due to the direction in which heat was passing: when the current was directed from without inwards, we had the sensation of warmth; when from within outwards, the sensation of cold. Hering, relying mainly on his contrast- and exhaustion-experiments, considers that we have a single apparatus excitable in two ways, the two sensibilities standing in such relations to one another that, as one is exhausted, the other is reinforced. Goldscheider (12) rejects this notion of the double action of a thermal stimulus, on the ground of certain experiments mentioned in the first part of this paper. I have repeated these experiments and can fully confirm the results. We have then to look upon our temperature-sensations as mediated by two distinct sets of nerves, each set being quite independent of the other. The excitement of one set gives a characteristic sensation recognised as cold; the other, a different sensation recognised as heat. The theory cannot be made to turn on the question as to whether the special nerve is gaining or losing heat; for, as these experiments show, the results can all be obtained with mechanical stimulation. As regards the after-action, on which so much stress has been laid, this, as Goldscheider remarks, is a purely nervous phenomenon quite independent of any changes of temperature.

The bearing of these observations on the measurement of the sensibility to temperature-differences is considerable, and there seems little doubt that the work designed to test the application of the psychophysical law to the skin—with its great average-error—will have to be at least reviewed in the light of these new observations. As to their influence on the methods of testing

the skin, it would be unsafe to predict. Eulenberg (3), in a very recent paper, advances the idea that both for pressure and temperature we must still, as in the past, test on surfaces and not on points.

This investigation has brought to light some new facts and results, which have, without doubt, their greatest importance in controlling other lines of work. Some of these results, as I have endeavoured to show, were independently worked out in this Laboratory: but, in presenting a claim for independence, I hope that I have still made it clear that to Blix belongs the priority; that Goldscheider's paper is very careful and complete; and that I am in a large measure indebted to both these observers.

My thanks are due to Prof. G. Stanley Hall for his aid and advice during this work. I also gladly take this opportunity to thank all those who have kindly placed themselves and their time at my disposal for experiment, and otherwise assisted me in this research.

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23*rd March*, 1885.

VI.—DISCUSSION.

MILL'S PROPOSITIONS AND INFERENCES OF MERE EXISTENCE.

By J. H. Levy.

In considering Mill's doctrine on this subject, it is best to commence with his statements respecting inductions of bare existence.[1] These alleged results of the inductive process may be considered the *summa genera* of such forms of predication; and it will be convenient to start from them and work downwards.

"With respect to general propositions of this class," says Mill, "that is, which affirm the bare fact of existence, they have a peculiarity which renders the logical treatment of them a very easy matter; they are generalisations which are sufficiently proved by a single instance. That ghosts, or unicorns, or sea-serpents exist, would be fully established if it could be ascertained positively that such things had been even once seen. Whatever has once happened is capable of happening again; the only question relates to the conditions under which it happens. So far, therefore, as relates to simple existence, the Inductive Logic has no knots to untie."

Now, I quite agree that "as relates to simple existence, the Inductive Logic has no knots to untie". But, where there are no knots naturally, we may, through that maladroitness in holding the threads of a complex investigation which is more or less an attribute of every human being, make a tangle; and that, in my opinion, has been done. It will always be to me a puzzle how a man of Mill's ability could so easily have reconciled himself to the notion that there is a whole class of generalisations each of which is (or may be) proved by a single instance. If this were true, instead of dismissing it with the remark that it affords Inductive Logic no knots to untie, I would say that it would be so extraordinary a phenomenon that, until it was adequately accounted for, the foundations of inference would remain a mystery.

I would first contend "with respect to *general* propositions of" existence, that they do not exist, or—to put the matter more clearly—that these alleged *general* propositions are not general at all. A general proposition is one actually or potentially in the form "Every x is y". In propositions of existence, y = existent;

[1] *System of Logic*, vol. ii., pp. 143-4.

and a *general* proposition of existence is one which can be put in the form "Every x exists". But this is a meaningless formula. The universal quantification of the subject strips the predicate of existence of all significance. When we say "Every diamond is combustible," we mean that every diamond in this universe of ours has the attribute of combustibility. If we say "Every diamond exists," we mean that every diamond in the universe has the attribute of existence. But, if we mean this we mean nothing; for the proposition is as vapid a verbal one as ever had conferred on it transcendental honours.

When I say "Every x is y," I mean that, within the limits of this universe, whenever and wherever x is found, y is found. When I say "Every x exists," the only legitimate sense which can be attached to the words is that, universally, whenever and wherever x is found, it exists. This is an identical proposition; and the fact that it is so disposes, once for all, of universal propositions of existence.

But, if there are no general propositions of existence, there are no inductions of existence, for the inductive process always results—potentially at least—in the proof of a general proposition. What, then, are the instances given by Mill? Beyond a doubt, they are particular propositions. "Sea-serpents exist" does not mean "Every sea-serpent exists," which is nonsense; but "Some sea-serpent exists". There is no mystery whatever, therefore, in the fact that a single instance establishes it. If I were to see a sea-serpent, I could not, from that fact alone, and without calling in the aid of biological knowledge outside of that special experience, infer the existence of other sea-serpents. What rational person would infer from the observation of a particular picture or building the existence of an indefinite number of similar pictures or buildings?

I now go one step further; and maintain that "Some sea-serpent exists" is not, except in mere form, a proposition of existence. It is identical in meaning with "Some serpent inhabits the sea," which is a proposition of co-existence, and means that the attributes connoted by the term serpent and that of inhabiting the sea are sometimes found together in the same thing. It makes no real difference that, instead of one of the attributes being put for a predicate, they are all put together in the subject. To say that a sea-serpent exists is to say that the various properties which make it up co-exist. All propositions, therefore, which are formally predicative of existence, but whose subject is analysable, or connotative of two or more attributes, are really propositions of co-existence.

All propositions may be thrown into the existential form. "Man is mortal" may be rendered "No immortal man exists"; and "Some swans are black" may be stated as "Some black swans exist".

Let us now see how far we have travelled. There are no

general propositions of existence. There are, consequently, no inductions of existence. The instances cited by Mill as general propositions of existence are not only not general propositions, but they are not propositions of existence. Indeed, the vast majority of propositions which pass as existential are not so except in mere verbal arrangement. What have we left? Propositions which are existential in form, and whose subject denotes a single attribute or none at all.

Let us now examine what is the real import of these. If we take first those which assert the existence of a single attribute, we find the process of elimination still forced on us. Suppose we say "Whiteness exists," or "Wisdom exists". Do we intend to assert that whiteness and wisdom are found as isolated phenomena? Assuredly not. We mean that they are *qualities* of some of the things we know, which is one way of saying that they co-exist with other qualities. If it were otherwise, we should not say that they exist; for we have no evidence of them apart from the things of which they are attributes. They are abstractions; and, as such, we need to be very careful in interpreting assertions of their existence. We never know clearly what a proposition is intended to assert till we see what is involved in its denial; and this is especially true of the class of propositions we are now considering. It would be very difficult even to guess what a person who denied the existence of pleasure was 'driving at,' if we had never come across the notion that pleasure is the mere negation or cessation of pain.

So again with propositions of which the subjects are non-connotative. If I say "Paris exists" to a man who does not know what is denoted by "Paris," the proposition conveys to him no meaning but the verbal one that something is called Paris. If, however, he *does* know what I intend to point out by "Paris," the proposition asserts for him the co-existence of the congeries of phenomena which go to make up the capital of France.

So far, then, we meet with no real proposition of existence, and, therefore, no inferences of existence. Last of all we come face to face with the assertion made by various great writers that out of the possible reach of our cognitive faculties there exists something whose irrelativity is expressed by such terms as the Absolute, Unconditioned or Unknowable. With this, as a philosophical doctrine, I am not here concerned. I refer to it solely in its connexion with the theory of predication. Mr. Herbert Spencer says of this Unknowable that "it is the abstract of *all* thoughts, ideas or conceptions. That which is common to them all, and cannot be got rid of, is what we predicate by the word existence."[1] The word existence is here defined so as to make it mean the Unknowable; but this empties the statement that the Unknowable exists of all meaning. If I understand Mr. Spencer's doctrine aright, it is that we have or may have, a *consciousness* of something

[1] *First Principles*, p. 95.

unconditioned, but not a *knowledge* of it. If so, I have nought to say with regard to this consciousness; for it cannot be stated in propositional form. When a proposition has for its subject the Absolute or Unknowable, it must be either meaningless or absurd; for the predicate must convey some information or none, and if the former, it stands in contradiction to the subject.

Propositions of mere existence, then, when they are not mere figments, are variant forms of other kinds of predication. Mill's defence of them against Professor Bain[1] really amounts to a surrender; for, according to it, the assertion of existence is only a disjunctive assertion of co-existence, sequence, or resemblance; and therefore has, on his own showing, no right to a separate place in the classification of the heads of predication.

IS THE DESIGN-ARGUMENT SCIENTIFIC?

By H. M. Stanley.

By 'scientific' we understand—in accordance with the method and spirit of natural science. The scientific spirit is the ruling factor in present culture and the unique intellectual characteristic of this age. In past periods various elements of culture have ruled, but never before in the history of human progress has the scientific spirit achieved the ascendancy. In Hellas art and philosophy were ruling powers, and in Rome politics was dominant; but in both natural science played but an obscure part. In the Middle Ages the theological and religious spirit was the *Zeitgeist;* while to-day every department owes allegiance to science. Industry is plainly coming more and more under the rule of science, is losing its empiric character and becoming scientific. The realism and analytic character of recent art and literature proclaim the influence of science. Psychology, History and other like branches are being rapidly made scientific. Finally, perhaps the greatest intellectual conflict of this age is with respect to the question whether religion and theology can be validated in like manner. Whether science is to maintain this supremacy indefinitely is difficult to say.

Science interprets not the universe by man, but man by the universe. It goes outward, and seeks to regulate that which is within by what is discovered of that which is without. It disclaims all automorphism and anthropomorphism. Man is a part of the universe, and inevitably correlated with it. Let not man, says science, in his self-sufficiency lay down theories, philosophies, cosmogonies, theologies, out of his own consciousness; but let man know and obey nature, and thus attain power by obedience. It is useless for man to propitiate the gods he has

[1] *System of Logic*, 8th ed., vol. i., pp. 112-113, note.

set over nature, but, if he will be master of himself and his environment, let him know nature and act accordingly. Science, moreover, is characterised by great clearness and distinctness. Science acknowledges the darkness of the unknown beyond its light, but only the ever-widening circle of light is science. It is, furthermore, ever to be kept in mind, as Prof. Huxley insists, that science is merely an extension and organisation of common-sense; it rests upon the assumption and speaks the language of common-sense realism. Philosophy always lies behind science, and the postulates of science are the problems of philosophy. The object of this paper is to inquire how far Teleology may thus be ranked as science.

Teleology investigates intelligence in nature; Objective Psychology investigates intelligence in other beings than the individual investigating. It is generally acknowledged that we attain a knowledge of intelligence in other beings than ourselves by analogical induction, by comparison of their acts and works with our own and inferring from equality of effects equality of causes. Men of science are just at present cultivating with great eagerness Comparative Psychology in regard to infants, savages and animals, and they readily acknowledge that analogy is the only method of investigation.

For instance, Dr. Romanes in his *Animal Intelligence* remarks that "it is evident that in our study of animal intelligence we are wholly restricted to the objective method. Starting from what I know subjectively of the operations of my own individual mind, and the activities which in my own organism they prompt, I proceed by analogy to infer from the observable activities of other organisms what are the mental operations that underlie them." Other passages might be cited from Dr. Romanes's more recent work, *Evolution of Mind in Animals*, from Lauder Lindsay and from many other writers, to the same effect. There are thus several well recognised departments of Psychology, which have the same object as Teleology, *viz.*, investigation of objective intelligence, and the same method, analogical induction; and hence, if there be a science of Teleology, it is a department of Comparative Psychology. The Cartesians denied intelligence to animals, and so also a science of intelligence in animals; and those who deny intelligence in nature deny of course a science of intelligence in nature; but if there is a scientific Teleology, its place is as the crowning department of Comparative Psychology.

The perception of order and capacity for ordering grow up in interdependence. Perception of order precedes an ordering by man, since every adapting of means to ends presupposes knowledge of means—an order in nature of which man takes advantage. Designing by man presupposes knowledge of order and function in nature, but this knowledge may exist as pure science without reference to application. However, the discovery of order is *per se* an end, and designing with reference to at-

taining further knowledge is plainly dependent upon past knowledge and past design. A man to know must design, *viz.*, at least attend, and dispose organs; and to design must know, since knowing is perception of order and adaptation in nature and man, which can be taken advantage of by man. Does this interdependence of knowing and designing prove design in nature? It was the *dictum* of Prof. Baden Powell that whatever requires intelligence to apprehend, requires intelligence to originate. The intelligible can only arise in intelligence.

It is certainly natural to conceive that what appeals to our thought arises from thought, for we know that what requires our intelligence to comprehend would require our intelligence to execute. Since the perceiving of order implies the capacity of conceiving ourselves as originating intelligence throughout the realm of knowing, Fichte came to interpret the All as arising in the subjective intelligence. But conceiving ourselves as originating, or other intelligences as originating, is not proof that in reality there is this origination in intelligence. It is from this point of view conceivable and possible that the order of nature arises from design, but science rests not upon the conceivable and possible but upon correspondence with reality proved by facts; hence the belief that there is design in nature, if it will have a scientific basis, must rest upon analogy, the principle of equality of causes for equality of effects, which is the principle employed by science in investigating design in fellow-men and fellow-animals. Science, of course, employs the term 'cause' in the popular unreflecting way, without any reference to metaphysical doctrines.

The first process by which the man of science attains a belief in design by other beings is inference from observed activities. Many scientific observers have seen monkeys obtain oysters by breaking open the shells with stones used as hammers; and from this action and other actions, by referring to their own experience and accepted human experience, they have supplied the fourth term of this compound ratio—

Human acts : intelligence : : acts of monkey : x (intelligence).

Three terms are given, and the fourth is added through sense of relation, the relation of equality of causes for equality of effects. The teleologist, putting for the third term activities of universe, adopts a precisely similar ratio. The universe is an indefinitely extended single being whose activities are orderly and adaptive, and hence by parity of reasoning with previous case, they arise in design.

What now are some of the reasons why the design-argument is not generally accorded by men of science the scientific position which this parallelism points out?

In the first place, there is an objection from Physiology. The recent great progress of physiology as showing a constant correlation of mind and nerve, has led many inquirers to lay down as

an axiom that nerves are indispensable to consciousness and intelligence of any kind; hence Prof. Clifford went so far as to demand that teleologists should discover some huge cosmic brain, if they wish to give a scientific character to their speculations. Dr. Romanes in his recent book, *Evolution of Mind in Animals*, assumes, as a scientific axiom, that a nervous organism is essential to the possession of intelligence. The ordinary method of physical science has been to separate the workings of nature from rational action, as being merely redistribution of matter and motion, which are orderly and adaptive, not by virtue of intelligence, but because of chance, necessity or some such metaphysical entity. The tendency of the most recent science, however, is toward agnosticism, which rather presumptuously denies the capacity of the mind for ever solving satisfactorily the problem of the origin of the order of the universe. That nature is full of order and adaptation is the basis of all science; but it is seriously questioned whether this order and adaptation arises in intelligence; although if it occurred in connexion with a nervous organism, it would readily be recognised by science as arising in intelligence. On the other hand, Teleology claims that order and adaptation are universally good evidence of intelligence whether discerned in connexion with a nervous system or not. In the former view there is exaltation of manner, in the latter, of matter of activity.

It is to be remarked with reference to this physiological objection, that men inferred intelligence in bodies from their activities long before the nervous system was discovered, and that the great majority of mankind at the present day are wholly dependent for their knowledge of individual objective intelligence upon inference from activities, there being complete ignorance of the physical organs of intelligence. It would seem that the kind of activity as orderly and adaptive is more important than the basis of activity in material organism.

Again, this physiological objection may be combated as anthropomorphic; as may also the objection so often made, that the regularity of phenomena, the inexorable law, revealed by science, destroys the theory of intelligent choice in nature. Science reveals nature as a whole, stretching away indefinitely into minuteness as Chemistry reveals, and into largeness as Astronomy reveals; and science points out that man is intellectually limited by being physically part and parcel of this great wheel of nature. If this be so, it is evident that man is apt to interpret as rigidly mechanical and unalterable that which so far transcends him in space and time as to appear so. Give intelligence to one of the millions on millions of red corpuscles in the human blood, and in its speck of a lifetime, all that occurs about it in the organism of which it is a part must seem mere mechanism. Even so the man of science, who is in space and time but as a corpuscle in the being of nature and God, inclines to

a mechanical theory, and doubts or remains agnostic as to a teleological theory. The largeness of the scale upon which the intelligence in nature works and the relativity of our knowledge must be taken into consideration. Taking this scientific view of the universe, it is anthropomorphic to suppose that all intelligence must be fitted with the same organs which we possess.

A second objection is that the analogy between man's works and nature's is not sufficiently close to be a scientific argument for intelligence in nature. This objection has been strongly urged by Hume and many other writers. With reference to this, it need simply be said that the closeness of the analogy between man's industry and nature's is constantly being made more and more apparent. Taking the classic example of the eye, the analogy is now (*pace* Helmholtz) by reason of scientific and mechanical progress very much stronger than it was in the time of Socrates and even of Hume.

The method of inferring from the noticed acts of a being that this being has conscious intelligence, as applied to the universe, leads to a Pantheistic conception. All the activities of nature as being orderly and adaptive are interpreted as arising in intelligence, even as the orderly and adaptive activities of a fellow-being, a man, are interpreted as proceeding from intelligence. This kind of teleological interpretation of nature has not received the attention it deserves, although in the case of animals and fellow-men it is most common and natural. The modern scientific conception of the unity of natural forces makes this interpretation of nature very easy. In this Teleology God is intelligence and power immanent in universe, just as Psychology regards man as intelligence and power immanent in the human body.

The second teleologic process which is common to Teleology and other sciences, as Archæology and Comparative Psychology, is the method of inferring intelligence from products and remnants of action. This is more indirect than to infer intelligence from activities, and consequently involves greater liability to mistake. To have seen a man hoeing avails more as evidence than to have seen marks which are attributed to a hoe. The comparative psychologist infers by analogy from watching the action of a savage that he has power of design, is consciously intelligent; but the archæologist infers that a mere bit of chipped flint—to the ordinary eye, a natural object—is a machine, a product of savage design. This argument from machine to mechanician has always been the common argument of Teleology. The eye, the human body, the earth, the universe, are wondrous mechanisms, which could only have originated in superhuman intelligence.

This method as applied in Teleology gives a Deistic conception. The universe is a great machine, a practically infinite orderly succession of second causes, which as orderly and adaptive by analogy to man's works has originated in conscious intelligence. In pure Deism the universe is a machine which Deity originally

wound up and set agoing, and which runs on without any intervention. Other forms admit intervention, and make God not only fabricator but also engineer. Hume's objection that we are acquainted with watch-makers but not with world-makers, supposing the principle not directly questionable, may be answered from the point of view of Pantheistic Teleology, that we have as direct acquaintance with the universe as with men.

Pantheistic and Deistic Teleology may be united in a scientific Theism, just as the mechanical and psychological views of man are united in a scientific Anthropologism. The physicist views the human body as a mechanism, and he traces already a long series of physical causes and acknowledges that there is a practical infinitude of causes still to be traced. The physicist applies a mechanical theory to the universe, and interprets it as a practically infinite closed circle of physical causes. The scientific psychologist finds the human body to be, not merely a closed circle of physical causes, but more, an embodiment of conscious intelligence. The psychical series does not add to physical force, does not intervene in the physical series, although associated with it. The two series do, however, in some unknown way mutually influence each other. As to the character of the relation, this is at present outside the field of science, and in the field of philosophy and speculation. Science recognises as a fact a sense of initiation in consciousness, and it bids us keep on willing as if we had some control over the course of events. If realism and the doctrine of free-will are illusions, science is not concerned, as its basis is simple common-sense. The human consciousness is, according to present science, both transcendent and immanent with reference to the series of physical causes. The physical series goes on simultaneously with the psychical, and in direct connexion with it, not in any pre-established harmony; there is interpenetration, yet the psychical series does not intervene in the physical. The psychical thus lies outside of and transcendent to the physical, no psychical link taking the place of a physical or *vice versâ;* yet there is immanence, each psychical link being correlated with a physical. As there is scientific basis for transcendence and immanence of intelligence in man, so also there may be for intelligence in nature. Deism finds its analogue in the notion of a spiritual substance wholly transcendent to the physical series in man, and intervening in it. Pantheism, in the form which makes God equal to the universe, finds its analogue in anthropological materialism. How this method of treating Teleology is related to evolutionism in its complete form, has been considered by the writer in the *New Englander* for September, 1883.

VII.—CRITICAL NOTICES.

Types of Ethical Theory. By JAMES MARTINEAU, D.D., LL.D., Principal of Manchester New College, London. 2 Vols. Oxford: Clarendon Press, 1885. Pp. xxiv., 479; viii., 539.

All English students of Ethics who are acquainted with the polished and powerfully written essays on philosophical subjects which Dr. Martineau published, in collected form, sixteen years ago, and who are at all aware of the influence that he has exercised for a longer period over successive generations of hearers, will have hailed with satisfaction the appearance of these two volumes. And their expectations of pleasure and profit to be derived from the work—especially from that part of it in which Dr. Martineau's own ethical view is expounded—will not be disappointed. Whether, indeed, the book will contribute materially to turn the tide of opinion, which has long drifted steadily away from the ethical position that Dr. Martineau adopted in past years and still maintains, is a different question; to which, perhaps, I am hardly able to give a sufficiently unbiassed answer. I will try to do what the limits of a Critical Notice allow, to enable my readers to answer it for themselves.

The plan of Dr. Martineau's treatise is that of "placing the positive construction of doctrine at the centre, midway between two wings of critical analysis". The true method of ethics, as he conceives it, is essentially psychological; it starts with the moral sentiments of the self-conscious man, which it is the business of ethics "to interpret, to vindicate and to systematise". It is admitted that "in dealing with its problems it is impossible to remain within the limits of self-interrogation—it is inevitable that ethics should run out beyond the circle of mere introspection, in order to determine" the relations which man bears to Nature and to God; but it is an essential characteristic of the true ethical method that it "begins from the self-conscious man, as better known, treats the phenomena so found as genuine phenomena," and "gives to reflective self-knowledge precedence, in ethical relations, over other knowledge". It is therefore contrasted, in the first place, with "Unpsychological" theories, which give priority to the investigation either of Nature, considered as the "totality of perceptible phenomena," or of "the eternal ground and cause whose essence they express". But, in the second place, the true method of ethics, we are told, is not only psychological, but "Idio-psychological"; it not only starts with the moral sentiments, it also "vindicates their independent character" and resists all efforts to reduce them to some other species of mental phenomena. It is therefore opposed to all systems which "slur the boundaries" of our several faculties

and attempt to "make out that the moral differences which they are engaged in cross-questioning are only *sensational* differences under skilful disguise; or, it may be, *intellectual* differences in an emotional form; or, again, *æsthetic* differences brought with an *alias* into court". Such systems—which are all "fairly reducible" to the three varieties just distinguished—are designated by Dr. Martineau as "Hetero-psychological"; and he places his criticism of them after the exposition of his own "Idio-psychological" doctrine for the important philosophical reason that we ought to ascertain the "story" that the moral consciousness "tells of itself," before we attempt to "evolve the moral from the unmoral phenomena of our nature". On the other hand—if I mistake not—his reason for placing his criticisms of "Unpsychological" theories first is rather a historical one. "Psychological ethics," he tells us, are "altogether peculiar to Christendom"; the Greek schools are "all essentially unpsychological and objective,"[1] and it is therefore, in accordance with the order in which thought has actually developed itself to begin our study of ethics with the "Unpsychological" scheme of Plato. We find, however, that, in order to complete the critical survey of this species of error, in its most appropriate types, we have to go down the stream of time to the 19th century. For while Plato and Spinoza are offered as the most instructive examples of the fate of ethical theory when based on Metaphysics instead of Psychology — being mutually contrasted as representing respectively the "system of transcendency" and the "system of immanency"—the most perfect type of a purely physical doctrine of morals is found in Auguste Comte. On the whole, therefore, historical grounds are only allowed a very subordinate place in determining the arrangement of Dr. Martineau's critical results. Plato, Spinoza with his predecessors Descartes and Malebranche, and Comte, occupy the first volume in chronological order; but Clarke, the antagonist of Spinoza, and Hobbes, who was to some extent Spinoza's master in ethico-political speculation, are relegated as "Hetero-psychologists" to the latter half of the second.

The contrasts which this arrangement suggests are no doubt instructive; and Dr. Martineau's own view is more sharply and clearly defined for us by its many-sided opposition to the other doctrines discussed. Still a treatment so disregardful of historical order almost inevitably sacrifices the more positive part of the instruction which the study of our intellectual ancestors has to give us. The use of Plato and Spinoza, as presented by Dr. Martineau, is a purely negative one; they are not stages in a continuous process of development towards the fuller and clearer ethics at which we have now arrived, but merely sign-posts to show us the path which the human mind should *not* take in the

[1] I have not space to exhibit as I should like to do the amount of error that appears to me to be involved in this sweeping statement.

pursuit of ethical truth. I am far from implying that this polemical attitude has made Dr. Martineau's treatment of these thinkers in any degree unfair, or, on the whole, seriously unsympathetic. I do not doubt that he is as genuinely anxious to "save what is imperishable" in the philosophy of Plato and Spinoza as to confute what is erroneous; and there is argumentative force as well as rhetorical persuasiveness in the apology he offers for his strictures on Plato:—

> "Philosophy aspires to rise above the transitory and gain the vision of eternal truth; and it pays the penalty of this proud pretension in being tried by codes and courts for ever new, and having to satisfy the claims of all. Appealing to the absolute, it forbids us to give it only an historical hearing; and we should do it its most aggravating wrong, did we not bring it face to face with the accumulative experience and matured insight of the human mind."

No doubt, so long as the admirers of a great historic thinker will not suffer him to keep his place in the past, but insist on presenting his works as a perennial source of philosophic truth, it is inevitable that we should handle these ancient treatises in a critical and polemical and not merely historical manner. Still, it is important that our criticism and controversy should be based on a careful study of their historical relations; because this alone can enable us to enter into their point of view sufficiently to make our criticism profitable; this alone can save us from the error of unconsciously mixing modern categories with those of an earlier period, and expecting a definite answer to questions which were not within the view, or only just within the purview, of the thinkers whom we are studying.

And if this is generally true, there is no ancient thinker of whom it is more true than Plato: since the ethical thought of Plato—whether we consider it in itself or in relation to his metaphysics—is not presented to us anywhere as a settled system, but rather as a process through a series of stages from the starting-point of Socrates to the fully formulated and articulated result of Aristotle. To understand the earlier stages especially, we have to keep before our minds the influence of the master: while for the comprehension of the ultimate drift of Platonic speculation the formulæ of the disciple give us invaluable assistance. What strikes me as erroneous in Dr. Martineau's rendering of Platonic ethics is, I think, chiefly due to his neglect of its historical relations. Thus he attributes to Plato a "preference of voluntary pravity to involuntary—a preference openly defended by him against the protest of natural feeling," on the strength of a passage in *Hippias minor*: whereas it appears to me certain that the argument of this dialogue—which belongs to the earliest, most Socratic, stage of Plato's development—is purely "elenchic" and negative in its direct results: the positive doctrine indirectly suggested being that voluntary pravity is impossible, on the ground of the well-

known Socratic identification of vice with ignorance. 'That no man knowingly prefers evil to good' is a proposition which forms the node of Plato's argument in more than one dialogue: and though his psychology led him to recognise 'discord' in the soul as a source of evil distinct from ignorance, I conceive that he never abandoned his master's position so far as to give the definite positive answer which Dr. Martineau tries to elicit from him to the question of Free-will. This appears, indeed, in the very passage on which Dr. Martineau seems most to rely for proof of Plato's Libertarianism—the passage in the myth at the end of the *Republic*, in which the souls of men are represented as choosing their lots in life. For wrong choice at this crisis of destiny is expressly attributed to ignorance: "our chief care must be, dear Glaucon," says the master, "to discover, each of us, who can give him *capacity and skill*[1] to choose the better life among the possible alternatives." The moral of the fable is, in short, the paramount importance of sound philosophy: for Plato, as for all the schools sprung from Socrates—with the partial[2] exception of Aristotle—the philosophic Reason is the sole natural lord and ruler of the soul. Hence, again, it appears to me to indicate a very profound misapprehension when Dr. Martineau suggests that Plato's fourfold division of Virtue properly implies a fourth principle in the soul, having "dominance over" *νοῦς*, *θῦμος* and *ἐπιθυμία*. He admits that Plato does not "overtly" introduce such a principle: but thinks that he gives "a clue to it" indirectly in the supremacy attributed by him to *δικαιοσύνη*: that he may "have felt that Intellect, as such, could not after all be put upon the seat of guidance, but must itself be made available in the career of life, by a power over it". I think it altogether impossible that Plato—or any other "vir Socraticus"—should have felt this: and I cannot find an atom of support for the suggestion in the *Republic* or any other dialogue.

And this leads me to ask how far Dr. Martineau is justified in characterising Plato's ethical theory as "Unpsychological". I grant that in Plato's ideal system of philosophic thought all judgments as to good and bad in conduct would be applications, to the obscurer region of concrete life, of the clear and certain knowledge of absolute good which the philosopher would

[1] *Τίς αὐτὸν ποιήσει δυνατὸν καὶ ἐπιστήμονα.* I must guard myself, however, from being supposed to rely on Plato's myths as a source of knowledge of his philosophy. Dr. Martineau's statement that "they often express the doctrines most sacred to his faith, though least effectually guarded in his philosophy," seems to me misleading; so far as it implies that Plato kept a place in his system for beliefs which he held to be certain though not philosophically grounded.

[2] I say "partial," because in Aristotle's view the speculative or philosophising reason was in a sense supreme, as its exercise constituted the highest mode or element of human life: though it did not, in his view, furnish practical guidance for the rest of life.

possess: the premisses of ethical reasoning would be somehow supplied by transcendental metaphysics. But this ideal deduction of ethics is nowhere presented to us as actually worked out in Plato's dialogues: certainly the ethical doctrine of the *Republic*, which Dr. Martineau is mainly occupied in criticising, is reached by the "inferior road" of empirical psychology. Indeed the only part of Plato's ethics definitely traceable to his doctrine of ideas is his view of the essential superiority of philosophic contemplation, in which the soul lays hold of reality, as compared with all other psychical functions or exercises. But this view is in no way dependent on the "transcendency" of Plato's metaphysics: in fact it is more definitely and emphatically put forward by Aristotle whose metaphysical "scheme" is distinguished as "Immanental".

When he passes to treat of Spinoza, Dr. Martineau cannot be accused of neglecting the historical relations of the system which he is mainly engaged in examining: he pays adequate attention to the antecedent doctrines of Descartes and Malebranche—indeed his careful exposition of the latter's system fills an important gap in the history of philosophy, as it has so far been written for English readers.[1] I do not, however, think that he has traced the development of Cartesianism through its various stages with quite the subtlety and closeness of investigation that he has employed on Spinoza.[2] He attributes to Descartes without qualification or reserve the doctrine that body and mind "are incapable of dealings with one another . . . and, for any mutual converse, might as well be at opposite ends of the diameter of the solar system". Now doubtless Descartes was tending towards this position: but there is no adequate evidence that he ever personally arrived at it. I do not think it had ever entered into his head at the time he wrote the *Meditationes:* and it appears to me very important to keep in mind that in the first stage—at any rate—of his philosophy, his fundamental doctrine was not the mutual *incommunicability* of mind and matter but their essential *independence*, proved to the self-conscious mind by the possibility of conceiving matter annihilated. On the other hand, I think

[1] I feel bound to point out a peculiarity in the arrangement of this part of the book, which is likely to perplex readers. Dr. Martineau gives first (pp. 156-193 inclus.) what appears to be intended as a complete exposition of Malebranche's system; and then afterwards (pp. 194-233) what he calls an "estimate" of the system—but in fact one of the most important parts of Malebranche's metaphysics and the whole account of his *Traité de Morale* is reserved for the so-called "estimate," which is therefore to a great extent expository rather than critical.

[2] As it is not very long since Dr. Martineau's *Study of Spinoza* was noticed in these pages, I have—under the urgent necessity of selection—passed over that portion of this new book which relates to Spinoza. I ought, however, to say that it is an independent piece of work, and not a mere *rifacimento* of the earlier *Study*.

that Descartes maintained from first to last a perfect distinctness in conception between psychical and material facts. When Dr. Martineau says—with rather less dignity of style than usual—that "his logic came to grief when he stumbled on the phenomenon of animal feeling . . . not knowing what to do with it, he awards it sometimes to the corporeal at others to the mental nature"; I think the critic has been misled by mere ambiguities or superficial inadvertencies in Descartes' language, and has overlooked the fact that he expressly extends his term "thought" (*cogitatio, pensée*) to include all psychical phenomena —sensations and volitions as well as operations of the intellect.[1]

Equally mistaken, I think, is Dr. Martineau's attempt to fix a similar charge of confusion on Malebranche, on account of his use of the term "animal spirits"—which the critic strangely seems to regard as an invention of the Cartesian school. At least, I find no evidence to show that Malebranche ever conceived his "animal spirits" otherwise than as purely material: though he seems sometimes to lapse from the strictness of his occasionalist doctrine so far as to regard the movements of the brain as causes of psychical phenomena.

However, the general account here given of Malebranche's system both metaphysical and ethical, is interesting, and—so far as I can venture to judge—in the main adequate. The reasons why Dr. Martineau has allotted so large a space to a writer whom he does not select as a "type of ethical theory" are partly, I suppose, suggested in the following comparison:—

> In (Malebranche) philosophy goes over from the hesitating position in which Descartes had placed it into complete supernaturalism; as, in Spinoza, it passes into complete naturalism. The contrast between them is interesting, as showing the divergent directions which the inevitable struggle for consistency may take, when a system deficient in coherence is seized on and worked out by minds of opposite tendency. Had Spinoza really been influenced by the mystical turn of thought which is ascribed to him, and which at first sight his language sometimes seems to favour, he would have found his task already accomplished by his French contemporary; and his ethics would have repeated, instead of superseding, the *Recherche de la Verité*. But the speculative genius which was common to both men served a different need in each of them; in Malebranche, to give base and persuasiveness to Religion; in Spinoza, to give unity and universality to Science; in the one to exhibit the universe as divine; in the other to prove it "geometrical"; starting in each case with premisses taken from Descartes.

The contrast thus drawn is striking and instructive: and appears to me in the main true, provided the terms "mystical" and "divine" are used in the restricted sense in which Dr. Martineau naturally—and, I think, legitimately—uses them: *i.e.*, as necessarily implying the conception of a Divine Spirit, to

[1] Compare (*e.g.*) the definitions given in his Reply to the Second Objections to the *Meditationes*.

whom volition and emotion, as well as thought, are attributed, and a personal or quasi-personal relation between the human spirit and the divine. But however much a religious philosopher may legitimately prefer Malebranche to Spinoza, he ought to point out that the former's superiority as a theologian is attained at the expense of philosophic consistency. The God whom Malebranche worshipped as a Christian, and the God whose necessary existence he was confident of proving as a Cartesian, remain in his system two distinct conceptions: no serious attempt is made to derive the former from the latter. Indeed, notwithstanding the horror which Malebranche doubtless sincerely entertained of the impious atheism of his contemporary, there is an almost startling affinity between Spinoza's conception of God, and that which Malebranche appears to have in his mind when he is writing purely as a metaphysician. The idea, he tells us, of the God that necessarily exists is a perfectly simple idea: it is the idea of "l'être en general, l'être sans restriction, l'être infini" as contrasted with "tel être". The reason alone gives us no right to conclude that God is a spirit: it is true that "il doit être plutôt esprit que corps, puisque notre âme est plus parfaite que notre corps"; but reason gives us no assurance that there are not beings "plus parfaits que nos esprits": and indeed it is evident that God being "l'être sans restriction" must "renfermer en lui-même les perfections de la matière". It is clear that we are getting very near to the Spinozistic deity, of which Extension is one attribute; but we get even nearer in a later treatise,[1] quoted by Dr. Martineau, in which we are expressly told that "God is extended no less than bodies"—though not after the manner of bodies, since his substance has no parts.[2] Why such a being, so far as cognisable by reason, should be conceived as "loving himself" or finite things, Malebranche scarcely tries to explain: and he is fain to admit that the attributes of goodness, mercy and long-suffering, which he is doubtless sincere in predicating of God, can only be predicated in a non-natural sense.[3]

[1] *Entretiens sur la Métaphysique*, vii. The phrases before quoted are from the *Recherche de la Verité*, III., ii., 9, and IV., 11.

[2] Before leaving Malebranche's metaphysics I must notice a not unimportant error in Dr. Martineau's account of his doctrine of ideas. Dr. Martineau represents him as holding that "the difference between images or representations and ideas is the difference between knower and known" (p. 260): that "modifications of the mind are confined to the senses and imagination, and do not enter the area of the reason" (p. 204). Now Malebranche undoubtedly distinguished his "ideas" from "modifications de l'âme": but Dr. Martineau does not seem to have observed that he expressly included under the latter term not merely "ses propres sensations" and "ses imaginations," but also "ses pures intellections." (*Recherche de la Verité*, III., ii., 1.)

[3] Cp. *Entretiens*, viii.: "Dieu n'est ni bon, ni miséricordieux, ni patient *selon les idées vulgaires.*"

I must apologise for having dwelt so long on the metaphysics of Descartes and Malebranche, that I have no space to examine Dr. Martineau's exposition of the latter's ethical doctrine. The fact is that, throughout this first volume, there is a distinct preponderance of metaphysical discussion over ethical; if it were not for the title of the work the reader would never suspect that his attention was being specially called to ethical theories. This is especially true of the last part of the volume, which is devoted to Auguste Comte; of the 105 pages which Dr. Martineau employs on this thinker, not more than a dozen appear to be concerned with his ethical doctrines. But, in fact, when we consider Dr. Martineau's conception of the nature of an ethical theory together with his conception of the proper limits of its treatment in the present work, the difficulty rather is to understand how he can legitimately have found so much to say about the ethics of the founder of Positivism. "The requirements of my subject," says Dr. Martineau, p. 265, "limit me to a consideration of its theoretic base, and withhold me from following it into the practical application"; and by "theoretic base" he means, as another passage shows, a "fundamental doctrine of obligation". But Comte, if I understand him, would as soon think of having a fundamental doctrine of being, as a fundamental doctrine of obligation, in Dr. Martineau's sense. Excluding "metaphysics" from his system, he consistently excludes every possible "theoretic base" of this kind for his Art of Morals —unless the term can be applied to his historical exposition of the gradually increasing ascendancy of altruism over egoism in the course of social evolution. If, therefore, Comte is seriously considered as a systematic moralist, it must be either as a historian of social development in its moral aspect, or as the constructor of a moral and political ideal for the future of society; and the reader will regret that Dr. Martineau, who pays a generous tribute of appreciation to the "wisdom," "noble humanity," and "profound insight" that characterise Comte's work as a practical teacher—in spite of its fantastic details—has not found himself able to dwell on it at somewhat more length. However, both the biography and the exposition and criticism of the Positive Philosophy which he has given us instead are careful, impartial, instructive, and—allowing for the polar opposition of philosophical standpoints—not unsympathetic.[1]

The "varieties of Unpsychological theory" which we have so far been occupied in examining have, in Dr. Martineau's view, the common characteristic that they "leave no room for the conditions

[1] I would especially commend the careful and judicious summary of Comte's debt to Saint Simon, which is here given. This debt is not such as to prevent us from attributing to Comte originality of the first order; but it is too important to be treated as lightly as it has usually been by the English admirers of Comte.

of moral agency, *viz.*, a well-grounded distinction of better and worse, a real authority in the former, and a free personality to give or refuse its rights". Let us now turn to the "Idiopsychological" method which alone, in our author's view, can duly provide these conditions; let us examine the "story which the moral consciousness tells of itself" through Dr. Martineau as its interpreter.

In discussing this narrative, it will be convenient to begin with the account given of the form of the moral judgment, and the general character of the objects to which it is applied; and then proceed to consider the detailed classification of these objects which Dr. Martineau offers. In the first place the moral judgment is essentially comparative or preferential: its primary form is not "X is right" or "good," but "X is better than Y". "The whole ground of ethical procedure consists in this: that we are sensible of a graduated scale of excellence among our natural principles, quite distinct from the order of their intensity." Hence, to express the "attribute ultimate and essential" which moral judgment predicates, the word "moral worth" is to be preferred, since "duty" and "right" are so habitually used of "single problems and concrete cases, that they . . . do not easily lend themselves to the expression of relative intensities of excellence throughout the whole system of ethical combinations". At the same time, in each concrete case, each separate moral experience, the "duty" or "obligation" to prefer the worthier object to the less worthy is distinctly recognised: though conscience, or the moral faculty, in Dr. Martineau's view, is "the mere inner sense of differences along the scale of impulses," this sense carries with it an authoritative direction to choose the higher. And he holds that these notions of obligation and authority do not merely express a relation—as in the Kantian view—between the autonomous rational self and the non-rational inclinations: "to speak of one part of self imposing obligation on another part is to trifle with the real significance of the sentiments that speak within us". If "the sense of authority means anything, it means the discernment of something higher than we": and as "we" are "persons," this higher something can only be "another Person, greater and higher and of deeper insight". In short, a "subjective conscience is impossible"; the moral preference, *quâ* moral, is essentially a preference commanded by God: and since the validity of the dictates of conscience must stand or fall with the validity of their theological implications, the so-called "Idiopsychological" method of Dr. Martineau turns out to be—if I may so say—essentially *Theo*-psychological.

I do not now propose to argue against this view; but I think that the ancient and well-known difficulties involved in it deserve more attention than they have received from Dr. Martineau. If the claim to authority, essentially involved in the recognition by the human mind of moral differences, can only be conceived as

the authority of "another person," the following dilemma is immediately presented: Is this other Will, in its turn, to be conceived as moral or non-moral? To take the latter alternative, to say that our ultimate obedience is due to mere arbitrary external Will, to which no moral attributes can with any meaning be applied, is a solution from which some theologians have not shrunk; but I conceive that such a view would be repudiated as an offensive paradox by the moral and religious consciousness of most plain men. If, on the other hand, the Supreme Will is affirmed to be essentially a moral will, then the theologian is called upon to explain in what sense the term "moral" is predicated in this affirmation; and since he is manifestly under the necessity of giving it some signification which will *not* involve a reference to an external authority—for the Will was assumed to be supreme, and we cannot have Person set over Person *ad infinitum*—he will have to explain why the essential meaning of moral choice, as attributed to God, cannot also be the essential meaning of moral choice as attributed to man.

And such an explanation is, I think, especially due to us from Dr. Martineau, since it would be difficult to find a philosophic writer whose conception of the Divine Mind is more definitely and confidently anthropomorphic. Not merely does he hold and express with the utmost emphasis—what I trust I may speak of as the 'better opinion' of theologians generally—that religious obedience cannot be due to mere omnipotent Will, conceived without moral attributes; that, entirely divorced from a moral nature, mere power or intelligence could be the object of no "veneration"; that only by attributing to God an "inward rule of Right which gives law to the action of his power," and allowing the validity in man of a "sense of a Divine kindred and a Divine likeness," can we "elevate into 'Authority' what else would operate only as a necessity or a bribe". He goes further than these current generalities; he presses the analogy between Divine and human morality to the utmost extent that common sense and common reverence would permit, in such passages as the following:—

"In expressing their conception of a Divine moral government of the world, men are not content to say, 'God will deal with us according to our works', but 'God *must needs* deal (*i.e.*, *ought*[1] *to deal*) with us according to our works'" (p. 105). Again, "Christianity . . . finds [God] sympathising with the struggles of tempted souls . . . nor is it possible to recognise this sympathy with human probation, without in some way carrying up the light and shade of moral distinctions into His own inmost being. The only question is how to conceive any shadow there and hold the idea of a contrast at all. Is it not impossible that the faintest evil should be in Him? Perhaps the natural answer of Christian feeling would be: *Morally* impossible most assuredly it is; but *naturally*, or otherwise than by preferential affection, not so: the *idea* of the alternative evil cannot be denied

[1] The italics are Dr. Martineau's.

to Him, without limiting His view of possibilities; the power to realise it, were He intent upon it, can still less be questioned; that He rejects it from his personal determination . . . expresses his active repugnance to it (p. 86).

If we can say, without using words in a non-natural sense, that the distinction of good and evil exists prior to God's choice, that he "ought" to choose good and realise justice, but that it is not impossible for him "otherwise than by preferential affection" to choose evil and do injustice; why can we not similarly conceive of moral choice in man, *i.e.*, without any reference to an external Will?

I am not arguing that Dr. Martineau is wrong in regarding this reference to an authority beyond ourselves as implied in the common notion of moral obligation. According to me, he is wrong not in what he affirms but in what he denies: it is half the truth to say that the moral reason in me which claims authority over my non-rational inclinations is not merely *my own* reason; but it is no less true and no less important to affirm, with the late Professor Green, that it *is* my own, and that "it is the very essence of moral duty to be imposed by a man upon himself".

There is another point of some importance in Dr. Martineau's view of our common moral judgments, which appears to me difficult to reconcile with his account of their theological implications. He holds that the "fundamental ethical fact" is the recognition of merit in a certain choice between alternative principles of self-conscious action: and he contrasts strongly the *moral* choice in which the *highest* of two alternative principles is chosen, from the *prudential* choice in which—as he strangely holds—we yield to the *strongest* impulse. "Among our springs of action," he says, "there prevails a moral scale, according to the order of excellence; and a prudential scale, according to the order of strength": and, if I understand the drift of ch. 3 on "Merit and Demerit,"[1] he holds that the merit attaching to any particular moral choice is proportional to the discrepancy between the moral and prudential scale, as applied to the particular alternative of conduct between which the choice is made. But he also holds that a "belief in a retributory judgment is inseparable" from the recognition of moral obligation: and it appears to me that such a belief must inevitably have the effect of obliterat-

[1] I ought to say that Dr. Martineau does not expressly make the statement in the text as to the proportion between the merit of a moral choice and its divergence from prudential choice. But he makes a corresponding statement with regard to *demerit* ("where the discrepancy is greatest between the moral and the prudential order of principles, the guilt is least: and where the discrepancy is least, the sin is greatest"): and the whole drift of his argument seems to imply that "merit" and "demerit" are to be similarly treated, *mutatis mutandis*.

ing any divergence that would otherwise show itself between moral and prudential choice of alternatives. We should thus arrive at the paradoxical result that the more intensely and unreservedly a man holds a belief which the moralist declares to be inseparable from moral judgment, the more impossible it is, according to the same moralist, that any merit should attach to his moral choice!

So far I have not paid special attention to Dr. Martineau's account of the *objects* of moral judgment or choice. As it is in this part of his doctrine that he—on the whole, I think, correctly—regards himself as opposed to the "general consensus of modern English opinion," it is important to examine it carefully. I find, however, considerable difficulty in stating the exact issue; because it appears to me that in most of the general discussion which Dr. Martineau bestows on this subject (in ch. 1 of vol. II. book i.)—and especially in that part of it which is directed against my own views—there is a fundamental confusion between two questions which, in my opinion, have very little to do with each other; and which, at any rate, it is quite indispensable to distinguish clearly and discuss separately, as they have to be dealt with by quite different methods. There is, first, a historical or psychogonical question, to which in my *Methods of Ethics* I have made a passing reference[1]: I have stated it as my view that in the normal evolution of man's moral consciousness—both in the individual and in the race—moral judgments are first passed on outward acts, and only later, as the moral consciousness gradually develops and becomes more mature, the paramount importance of the inner principle of action comes to be recognised. This is the view that I have been led to take mainly by studying morality in the early stages of its development, and noting the gradual and slow process by which the distinction between moral and legal rules and the distinction between virtues proper and other excellences have come to be realised; but as the question, according to me, is one sociologically rather than ethically important, I have never had occasion to treat it in a systematic way. I entirely agree with Dr. Martineau in holding that in the mature moral consciousness, which alone each of us can make the subject of immediate observation and analysis, this earlier stage of development is altogether past; and we recognise that it is on the "inner principle" of an act that its morality depends. The issue that I am concerned to raise with Dr. Martineau does not

[1] In my first and second editions I devoted a page to this topic in Book III. ch. i. § 3, and referred to it again *en passant* in ch. xii. § 1 of the same book. As the former passage is quoted by Dr. Martineau for controversial purposes, I may point out that the greater part of it was omitted in my third edition: partly because I thought it was to some extent overstated, partly because I was afraid that its wording might encourage the very confusion pointed out in the text.

in any way turn on the antithesis of *inner* and *outer;* it turns entirely on the altogether different distinction between *intention* and *motive:* and it appears to me that, through his not clearly distinguishing the two antitheses, the greater part of his argument has no relevance to the only question which I regard as ethically important. So far as I can see, he continually uses in chap. 1 the terms "spring" and "principle" of action—and even "motive"—in so vague a way as to include what I call *intention* as distinct from *motive*, as well as what I call *motive* as distinct from *intention*[1]: and when, in chap. 6, he does come to consider the issue between "motive" and "intention," he only considers it in the paradoxical form in which it is raised by Bentham, who maintains that there is no such thing as a bad motive. Bentham's statement is, I think, capable of defence, after proper explanation[2]; but I have always avoided it as a misleading paradox: I have always admitted that the common moral sense of mankind judges *motives* as well as *intentions* to be good and bad, and mature reflection leads me to approve, broadly and generally, of this judgment, as I find adequate utilitarian justification for it. The position that I maintain, against Dr. Martineau, is that our common moral judgments of right and wrong relate primarily to intentions as distinct from motives; that we do not primarily consider, in approving or disapproving of an act, what effects the agents *desired*, but what he *designed* to produce: the effects that he desired may have been purely good, but if other effects that he distinctly foresaw were bad, we do not allow him to relieve himself of responsibility for these latter on the plea that he felt no desire for them. If a man commits perjury to save a benefactor's life, we may admit the goodness of his motive as a mitigation of his blameworthiness, but that is all: we judge the intended perjury as morally criminal, though not so criminal as if it had been done from a sordid motive.

It is conceivable that the supposed perjurer may have acted not only from a good motive, but with the belief that he was acting rightly; he may have chosen perjury as a less evil than the sacrifice of his benefactor's life; still, the common sense of mankind judges his act to have been wrong, though we admit on reflection that it is in a certain sense right for a man to do what he thinks right, and therefore require for exactness of statement to distinguish "subjective" from "objective" rightness; but this distinction as so introduced relates primarily to *intention*, and not necessarily to motive at all. More commonly such an "altruistic" perjurer would recognise that he was doing wrong;

[1] *E.g.*, he speaks of the "mind estimating its own impulses and volitions" (p. 40) as if the two were convertible terms.

[2] He means (1) that pleasure is *per se* good; and (2) that there is no class of pleasures operating as motives which we could suppress without doing more harm than good to society.

and in this case we might say that the desire to do right ought to have prevailed over the desire to save his benefactor; but even in this case I hold that our common moral judgment of the act does not turn primarily on a comparison of motives. For we commonly regard it as a Stoical exaggeration to require a man to act always—or even as much as possible—from a pure desire to do right; we think that in ordinary human life other motives, which yet we admit to be in a sense 'inferior,' normally and properly come in. Hence, in many important cases, the question of *motive* as distinct from *intention* is not even raised, in the application of our common notions of particular duties and virtues; what we regard as indispensable—as I have elsewhere said—is merely a settled resolution to intend or will a certain kind of external effects.[1]

I cannot, therefore, accept Dr. Martineau's view that our ordinary moral judgments are essentially comparisons of motives: such a doctrine is entirely contrary to my own moral experience, and—for the reasons just given—I do not think that it corresponds to the common moral experience of mankind. At the same time, as we certainly do take note of motives and judge them to be good and bad, it is interesting to consider how far it is possible to arrange our motives in a scale, exhibiting their gradations of ethical rank, as intuitively determined by our common moral consciousness; and how far such a graduated estimate of motives is capable of giving us practical guidance. The most original part of Dr. Martineau's work consists in his systematic attempt to construct such a scale, as the result of a number of particular moral comparisons. He admits that "the whole scale of inner principles is open to survey only to the wisest mind"; and he describes his own classification of motives as a "tentative draft" from a pyschological point of view: but he does not show much diffidence as to the universal validity of his ethical valuation of the springs of action classified; and he has no doubt that "however limited the range of our moral consciousness, it would lead us all to the same verdicts, had we all the same segment of the series under our cognisance".

[1] "Thus we call a man veracious if he has a settled habit of endeavouring in his speech to produce in the minds of others impressions exactly correspondent to the facts, whatever his motive may be for so doing: whether he is moved solely or mainly by a regard for duty or virtue generally, or by a love of truth in particular, or a sense of the degradation of falsehood, or a conviction that truth-speaking is in the long run the best policy in this world, or a belief that it will be rewarded hereafter, or a sympathetic aversion to the inconveniences which misleading statements cause to other people. Similarly, we attribute Justice, if a man has a settled habit of weighing diverse claims and fulfilling them in the ratio of their importance; Good Faith, if he has a settled habit of strictly keeping express or tacit engagements: and so forth."—(*Methods of Ethics*, 3rd Edit., book iii., ch. 2, p. 222.)

The following is his list: and, in examining it, the reader should keep clearly before his mind Dr. Martineau's fundamental distinction between the *primary* springs of action, which "urge men, in the way of unreflecting instinct, to appropriate objects or natural expression," and the *secondary* springs, "which supervene upon self-knowledge and experience, and in which the preconception is present of an end gratifying to recognised feeling". It should also be said that the list includes the "chief composite springs of action," along with those that Dr. Martineau regards as elementary.

LOWEST.

1. Secondary Passions :—Censoriousness, Vindictiveness, Suspiciousness.
2. Secondary Organic Propensions :—Love of Ease and Sensual Pleasure.
3. Primary Organic Propensions :—Appetites.
4. Primary Animal Propension :—Spontaneous Activity (unselective).
5. Love of Gain (reflective derivative from Appetite).
6. Secondary Affections (sentimental indulgence of sympathetic feelings).
7. Primary Passions :—Antipathy, Fear, Resentment.
8. Causal Energy :—Love of Power, or Ambition ; Love of Liberty.
9. Secondary Sentiments :—Love of Culture.
10. Primary Sentiments of Wonder and Admiration.
11. Primary Affections, Parental and Social ; with (approximately) Generosity and Gratitude.
12. Primary Affection of Compassion.
13. Primary Sentiment of Reverence.

HIGHEST.

I have not space to discuss this list from a psychological point of view: otherwise I should like to ask why the class of "passions" is so unusually restricted, why conjugal affection is omitted, whether wonder can properly be regarded as a definite motive, and whether "censoriousness" and "suspiciousness" are proper terms for desires of malevolent pleasure: and I should venture to criticise throughout Dr. Martineau's distinction of elementary and composite principles. As regards the ethical valuation—which, rather than the psychological analysis, it here concerns us to discuss—my view is that it probably corresponds about as well as any similar general scale would do to the judgments that men commonly pass as to the different elevation of different motives; but that the very effort to reduce these judgments to precision and system brings home to us forcibly how very vague and varying they are, and how impossible a task it is to assign a definite and constant ethical value to each different kind of motive in this general way, without reference to the particular circumstances under which it has arisen, the extent of indulgence that it demands, and the consequences to which this indulgence would lead in any particular case. It is easy to exhibit this difficulty even in the case of the motive that Dr. Martineau places lowest in the scale. When the preacher tells us that the

impulse to obtain pleasure from another's pain is altogether corrupt and abominable, we give a ready assent: but when the jurist tells us that the demand for "vindictive satisfaction" is indispensable to the effective administration of the criminal law, we shrink from branding as illegitimate even the desire of malevolent pleasure, so long as it is restricted to the satisfaction derived from getting a murderer hung, or a swindler brought to penal servitude. A similar reference to consequences is, I conceive, usually made, whenever a conflict of motives occurs, sufficiently sustained and important to lead us to conscious comparison and deliberate choice between them: and thus the moral issue inevitably becomes quite different from that which Dr. Martineau describes as normal: the decisive question is not which motive is higher, but which set of foreseen consequences is on the whole to be preferred. Dr. Martineau fully recognises that "it is the business of another department of ethics" to "estimate the consequences of actions"; but he thinks that this business should be undertaken "after settlement of the rank of motives". It appears to me, however, that in the very cases he selects to prove his theory, the judgment of common sense as to the motive that ought to prevail is manifestly determined by a broad consideration of the alternative courses of conduct to which the conflicting motives prompt.

Thus, so far as it is true that "the conscience says to every one, 'Do not eat till you are hungry and stop when you are hungry no more'" it is not, I venture to think, because a "regulative right is clearly vested in primary instinctive needs, relatively to their secondaries," but because experience has shown that to seek the gratification of the palate apart from the satisfaction of hunger is generally dangerous to physical wellbeing; and it is in view of this danger that the conscience operates. If we condemn "a ship captain," who, "caught in a fog off a lee shore, neglects, through indolence and love of ease, to slacken speed and take cautious soundings and open his steam-whistle," it is not because we intuitively discern fear to be a higher motive than love of ease, but because the consequences disregarded are judged to be indefinitely more important than the gratification obtained: if we took a case in which fear was not similarly sustained by prudence, our judgment would certainly be different. If, again, in a conflict between resentment and the desire of sympathetic pleasure, we think the former motive should prevail, it is only so far as we regard the resentment as being—to use Dr. Martineau's words—"well-grounded" and "the natural defence of Right among men": we condemn the parent whose sympathy prevents him from punishing his children sufficiently, not on account of the comparative lowness of his motive, but in view of the bad effects on the training of the child. And similarly in other cases.

I have only space just to notice the discussion of "Hetero-

psychological" theories that occupies the second half of Dr. Martineau's second volume. In the criticism of "Utilitarian Hedonism" with which it commences, the writer is traversing a ground now somewhat worn, and it is hardly surprising that he should not find much to say that is at once new and true: but many of his points are well-chosen, and his polemical rhetoric is often very effective. There is more freshness of interest, with no less rhetorical effectiveness, in the criticism of Mr. Spencer and Mr. Stephen—mainly of the former—which follows under the title of "Hedonism with Evolution". The discussion of the "Dianoetic" theories of Cudworth, Clarke and Price appears to me not quite up to Dr. Martineau's ordinary level in penetration and appreciativeness: and after reading it I am quite unable to understand how he can speak of himself as having "approximately adopted" the theory of Kant: since among English writers Clarke and Price certainly approach most closely to Kant's ethical position, and Dr. Martineau's arguments against the place that the latter writer assigns to the Reason must, I conceive, be valid against Kant, if they have any validity at all. On the other hand, the account of Hutcheson's system which concludes the volume—though not, in my opinion, free from serious misunderstandings[1]—is sympathetic, careful and interesting.

H. SIDGWICK.

Marius the Epicurean: His Sensations and Ideas. By WALTER PATER, M.A., Fellow of Brasenose College, Oxford. 2 Vols. London: Macmillan & Co., 1885. Pp. 260, 246.

Readers of Mr. Pater's earlier work, *The Renaissance*, will have naturally turned to this book, wishing to see what may be the fuller development, implied in its title, of the writer's thought. The following notice is not meant for them so much as for those who, not knowing the former collection of Essays, might perhaps pass by what is really a continuation of them, under the idea that it was only a historical novel. This is indeed its form: but in setting out what he has to say the author

[1] *E.g.*, when Dr. Martineau says, (p. 496) "If you ask [Hutcheson] whether Virtue is a quality of the action or of the agent, you gain no steady reply," he has, I think, overlooked the reply given in book ii., ch. 3, of the *System*, by means of the distinction between "material" and "formal" goodness. Nor do I understand why, because Hutcheson—with Butler, following Shaftesbury—tries to show the harmony between Benevolence and Self-love, he is therefore to be accused of making the *distinction* between the two illusory (p. 513): or why he is supposed to contradict his most cherished and characteristic doctrines and to hold that "pleasure desired or pain shunned is the only possible incentive to the will"—unless it is by a mistaken inference from a passage (*System*, i. 3) in which Hutcheson is expressly referring to *selfish* desires.

does repeatedly pass (to use his own words) "from Marius to his modern representatives—from Rome to Paris or London".

Put shortly, the story is as follows. Marius finds himself left in boyhood the head of an ancient Roman family, whose wealth and estates have, by the middle of the second century A.D.—the point where the story begins—dwindled to the possession of an old countryhouse, "half farm, half villa". Brought up here, in all country freedom and simplicity tempered by a certain feminine refinement, till his mother's death, Marius passes to the school of Pisa. The wider experiences of outward life now gained, while at the same time he eagerly lays hold on the *studia litterarum*, make him, at eighteen, a student of no ordinary seriousness and severity. He has seen in the death of a passionately-loved friend,—of that Flavian of whom the voice and glance were "like the breaking in of the solid world upon one, amid the flimsy fictions of a dream,"—something like "a final revelation of nothing less than the soul's extinction". He sets himself to philosophy for the resolution of the questions which life is now putting to him: and has worked out a "New Cyrenaicism" for himself, when, at the age of twenty, he is called to the service of the emperor Marcus Aurelius at Rome. Marius's own theories are now brought into relation with Stoicism as preached in the emperor's writings and acted in his life. And during the period —of about fifteen years—which follows, his friendship with Cornelius, a Christian *eques*, gives him glimpses of the "genius of Christianity," at first under the Minor Peace of the Church, and later in the persecutions which may be counted among Aurelius's mistakes. Finally, he saves Cornelius's life at the cost of his own: he is about thirty-five years old, when he passes away, "*anima naturaliter Christiana*".

This then is the story. When one asks, "What does it all come to?" it seems necessary to disregard the historic framework almost entirely. No one perhaps is justified in saying that a personality such as Marius was impossible in Roman life of the 2nd century A.D. But at any rate a great deal that is essential in Marius is better seen apart from the accidents to which the writer's art has given such reality. Of the two ways of thought, Stoicism and Christianity, which are brought especially to bear upon his own, an account is given, true and wonderfully sympathetic as it deals with Marcus Aurelius, and conveying an impression of reality in its presentation as to the early church in Cecilia's house. It simplifies things, certainly, to have them set before us, as in these two instances, from the original and in their beginnings. But, in taking the book seriously, and recognising as Mr. Pater says, that Marius's "age and our own have much in common—many difficulties and hopes," we have to "note" things, "as Marius could hardly have done".

At the risk of condemnation for hasty generalising, let it be said that the text of which *Marius* is the sermon has previously been

given, in various forms, in the work already referred to, *The Renaissance*. This is worth mention, because if the eleven or twelve years that lie between the appearance of the two books have induced the writer to emphasise and elaborate his original thought, his present exposition of it comes with all the more weight. It would be injustice to a work of art to attempt to reproduce what Mr. Pater has to say in any but his own words: the reader must consider this, if the frequency of inverted commas is wearisome.

First, the attitude towards philosophy—of the writer or of Marius—is one of renunciation. We heard, in the essay on Winckelmann, that while it was easy "to indulge the commonplace metaphysical instinct," a "taste for metaphysics" might be "one of those things which we must renounce if we mean to mould our lives to artistic perfection". And of philosophy we were told that it "serves culture, not by the fancied gift of absolute or transcendental knowledge, but by suggesting questions which help one to detect the passion, and strangeness and dramatic contrasts of life". Marius, who bears about with him from childhood to death a deep religious earnestness and certainly is not chargeable with dulness of intellect, finds that his Cyrenaicism requires the "limitation, almost the renunciation, of metaphysical inquiry". Of philosophy, then, strictly speaking, we must not expect to find much in the book. But perhaps just in this lies its value: that it gives the picture—recognisable by many men as true of themselves—of a really serious mind, that seems to itself to have apprehended a "weakness at the very foundations of human knowledge," and that while duly "trying all the spirits" has its ultimate refuge in some "instinct," some theory of "insight" or of "decisive conscience on sight". Marius, and perhaps (in Mr. Pater's phrase) his "intellectual heirs," are more concerned with applied than with pure philosophy. The plain acknowledgment of this as a starting-point clears the way: and the psychological analysis of Marius by himself or by his biographer has the different worth of Rousseau's Confessions for different students.

A theory of life, then, without metaphysics, which shall in some degree satisfy strongly-felt spiritual needs, the old satisfactions proving inadequate: this is what Marius has to seek. So far as he ever finds it, it is in a development or education of what is or seems to him to be peculiarly the self in him. This may be uncomforting doctrine to those who want a *Consolatio Philosophiae:* but do Aurelius or Boëthius supply anything better? Marius seems to stand in a school opposed to these; but, we read, "Cyrenaicism, old or new, may be noticed, just in proportion to the completeness of its development, to approach, as to the nobler form of Cynicism, so also to the more nobly-developed phases of the older traditional ethics". Or, as Mr. Pater puts it again, "perhaps all theories of morals tend, as they rise to their best,

and as conceived by their worthiest disciples, to identification with each other". The conception of the worthiest disciple, then, is what we have to look at.

In Marius, "New Cyrenaicism," Roman or modern, means the making the most, "in no mean or vulgar sense, of the few years of life; few, indeed, for the attainment of anything like general perfection". His motto is *Let us work while it is day!* He has passed from the limiting preference of the μονόχρονος ἡδονή with which original Cyrenaicism starts to the steady attempt after "not only as intense but as complete a life as possible". He claims liberty, of heart and thought, and he has learnt (like Winckelmann) to "multiply his intellectual force by detaching from it all flaccid interests". But he will not ignore what is outside him, even what does not, in its æsthetic character, make immediate claim upon him. The "venerable system of sentiment and ideas, actually in a kind of impregnable possession of human life" must be come to terms with. Attach oneself to it, and "one lets in a great side" of the world's experience, and makes "as it were with a single step, a great experience of one's own": there comes a "great consequent increase to one's mind, of colour, variety and relief, in the spectacle of men and things". Is the New Cyrenaic only a spectator? This question suggests itself not seldom in the book. In Marius himself, the development is certainly a development of seeing, of the capabilities of a spectator. "In the eye,"—so said his teacher in the temple of Æsculapius—"would lie for him the determining influence of life": he remains "the humble follower of the eye" in the opposition of good and evil to which Stoicism seems to blind Aurelius: and on his deathbed he is conscious that "the *seeing* of a perfect humanity in a perfect world, through all his alternations of mind, by some dominant instinct determined by the original necessities of his own nature and character"—has been always esteemed by him above "the *having*, or even the *doing*, of anything". How far do these points in his own nature differentiate Marius's Cyrenaicism? If Cyrenaicism is the "supreme artistic view of life," does it want the complement which in Marius's case it certainly gets, of a reference to "further revelation, some day" after this life? One cannot but feel that Mr. Pater's exposition, professing to be general, becomes now and then bafflingly individual. Let it be repeated, at any rate, that, in Marius the Roman, his whole intellectual course is a "diligent promotion of the capacity of the eye," a capacity existing in him, with all that it implied, from childhood: and that his lifelong training of his receptive powers as a whole, the life-long practising of himself to "see," has always "the purpose of a self-preparation towards an ampler vision, which should take up into itself and explain this world's delightful shows, as the scattered fragments of a poetry, till then but half understood, might be taken up into the text of a lost epic, recovered at last".

If, in trying to understand Marius's position, we leave out—as seems necessary—what may be supposed idiosyncrasies in him; if we may assume "insight" to be indispensable in the Cyrenaic scheme, yet so that the Cyrenaic disciple need not start with it as Marius does, but may acquire it; then the parts filled by Stoicism and by Christianity in his mental progress come into somewhat more of prominence than otherwise. In the Marius of the story—and it is difficult to keep him apart from the Marius of here and now—Stoicism, implying, as in Aurelius's tolerance of popular cruelty at the gladiatorial shows, a "sin of blindness" here and there in its views of the world, is first operative towards antagonism. He is able to see in Aurelius a certain mediocrity, though a golden. Yet, with that "strong tendency to moral assents" which perhaps may be allowed as a possible Cyrenaic generality, not an exclusive possession of Marius's, the antagonism to parts, or to personal realisations, of a system which might—its exponents said—"give unity of motive to an actual rectitude of life," makes him pass his own theoretic scheme in review, and seek what may be the true relation between it and Stoicism. What he gets out of this is the recognition of a "companionship," apprehended at least by Aurelius, if not taught by Stoicism, a companionship with an intelligible "assistant," "whose tabernacle was in the intelligence of men". To Aurelius, indeed, "the presence of this supposed guest" varies "with the intellectual fortune of the hour, from being the plainest account of experience to a sheer fantasy, believed almost because it was impossible". The pathetic inconsistencies of the *Meditations* have perhaps never been brought out more clearly than in Mr. Pater's seventeenth chapter. But Marius would feel common ground in such utterances as "All things are but opinion: and no man lives properly but that very instant of time which is now present": and, while the quasi-personal antagonism might survive as a corrective, this new "hope," of a "mystic companion," who might lead one "out of the merely objective pagan world," cannot but recommend itself to the thinker who, on the Cyrenaic basis "that all is vanity," has superinduced the need of a "pursuit after nothing less than a perfection". Is Marius more consistent than Aurelius? Granted, that Cyrenaic doctrine may be "realised as a motive of earnestness or enthusiasm," and that its disciple, "in his elaborately developed self-consciousness, has beyond all others an inward need of something permanent in its character to hold by": has he any logical right to find this, as Marius does, in a formulation of "that reasonable *Ideal*, which the Old Testament calls the *Creator*, and the Greek philosophers *Eternal Reason*, and the New Testament the *Father of Men*"? Marius the Roman is brought, not perhaps impossibly, to his 'glimpses that shall make him less forlorn' by virtue and by compulsion of his original endowments and needs. If from the beginning "the whole of life" has seemed "full of sacred

presences" to one who also has ever a "peculiar ideal of home," then the experience of Marius on that fair February afternoon, when from the recognition of his bodily self, as "determined by a vast system of material influences external to it, a thousand combining elements from earth and sky" he infers his intellectual being, "still more intimately himself," as "a moment, an impulse or series of impulses, belonging to an intellectual system without him," and so finds in that "perpetual mind" the permanency he has sought and the companionship whose inspiration "rounds and supports" the imperfection of his thoughts;—this particular experience in such a thinker, whose ideas and sensations, one ought to note, "never fell again precisely into focus as on that day," may be a not incongruous development. But if the endowments or the needs are either or both not present in the modern Marius! Cyrenaicism may be in one reading a "counsel of perfection": yet it surely does not exclude other readings, also adequate, such as "the unity of culture in which whatsoever things are comely are reconciled for the elevation and adornment of our spirits," or "the effort to tranquillise and sweeten life by idealising its vehement sentiments".

But, as before suggested, the want of consistency in doctrine, and yet the almost joyous consummation which Marius's individual evolution reaches, may in their contrast be the significant thing in the book. "*Se tu segui tua stella*"—is this the answer to Marius's own so frequent question—"What was all that"? In that apperception, at any rate, of the ideal, which "defined a personal gratitude and the sense of a friendly hand laid upon him amid the shadows of the world," his subsequent relations to Christianity are implicitly contained. To a modern Marius, the "soothing influence" which "the Roman Church has often exerted over spirits too noble to be its subjects yet brought within the neighbourhood of its action," might in some analogies be what early Christianity was to his Roman prototype. But once more, to the Roman Marius Christianity is presented as a sort of beatific vision satisfying at least approximately his trained capacities for vision, and becomes indirectly the instrument—when he saves Cornelius's life in the persecution—of that "self-devotion which should consecrate his life," towards which from boyhood he had anticipatorily schooled himself. By the Cyrenaic, not of Marian nature, would anything more than an "adjustment" be felt necessary?

As the book does not claim to be properly philosophic, it is perhaps allowable to talk of the "impressions" its reading leaves, or may be fairly expected to leave. The main one probably to most readers would be—of hopelessness in regard to systems, mixed with a remarkable religiosity and belief in the individual desire to believe.

ALFRED GOODWIN.

La Liberté et le Déterminisme. Par ALFRED FOUILLÉE. Deuxième Edition entièrement refondue et très augmentée. Paris: F. Alcan, 1884. Pp. viii., 367.

M. Fouillée's important work on *Freedom and Determinism*, now entirely recast and greatly enlarged, was first published in 1872. One at least of its characteristic ideas has since that time begun to have effect in ethical speculation; and the doctrine presented as a reconciliation of the ordinary theories of free-will and determinism has, taken as a whole, so much to distinguish it from other views, that the appearance of a new edition may be made the occasion for trying to show what exactly has been contributed by the author to the solution of the secular problem.

The "method of conciliation," although characteristic of M. Fouillée's philosophy, is not peculiar to it. Others have attempted the same method, though not in precisely the same form. And on this question of freedom of the will, even apart from any deliberate effort to reconcile the opposed doctrines, a certain convergence is perceptible at least between the views of those schools that have not had their general attitude determined by extra-philosophical considerations. M. Fouillée's method has, however, a distinctive character in the procedure by which he seeks to "intercalate a series of mean terms" between each doctrine and its opposite.

A "practical conciliation" is first arrived at by means of the author's theory of "idea-forces". Every idea, according to this theory, contains an active element, which, on its physical side, is a force. Whenever there is a conflict of ideas in the mind there is in the brain a conflict of corresponding incipient motions; when one of these becomes more powerful than the rest, muscular movement follows, and, on the mental side, an idea has passed into a volition. The idea of freedom arises among our "idea-forces". It begins to be formed as soon as we perceive the physical possibility of the contrary of each of our actions. Through several stages of abstraction we at length arrive at the idea of power to perform any action, whether the one we desire or its contrary, if only we choose. Many actions that would not otherwise have been done are done under the influence of this idea; we strive to realise our freedom by doing the contrary of that which we desire. The idea of freedom has therefore a practical influence equal to that which indeterminists ascribe to free-will itself. Ordinary determinism errs in not taking account of this practical influence of the idea of freedom.

But the theoretical difficulty still remains. Real indeterminism is incompatible with any scientific statement of the uniformity of physical law. The modern attempts to revive the doctrine of a *clinamen* cannot maintain themselves against criticism; nor is Kant's noumenal freedom combined with phenomenal determination more satisfactory. The method of "theo-

retical conciliation" to be adopted follows from what has gone before. We must find in determinism itself the means of constructing a complete ideal of freedom.

The feeling of an activity that may be called "free" because it begins from within has part equally in the pursuit of knowledge, in the sense of beauty, and in the moral sentiment. In knowledge it shows itself as "anticipation of experience" by the mind; in art its typical expression is "grace" or unconstrained movement, which is "the symbol of freedom"; but it is in morality, in the "love of others," that the ideal of freedom becomes complete. This ideal may be conceived as finding its realisation in a community where each individual freely (and not from a sense of obligation) seeks the happiness of others, who are also regarded as free. Perfect liberty is identical with the kind of happiness that would be the ideal completion of the joy of existence and of action. Hence it is an end and not a means. French philosophy, notwithstanding its false theory of indeterminism, perhaps partly in consequence of it, has seen this; and the French nation in its efforts to realise liberty and fraternity has shown the practical influence of the individual and social ideal of freedom; while English and German philosophy have made freedom subordinate, the one to utility, the other to the State.

In the author's "theoretical synthesis," the "idea-force" of liberty thus conceived is presented as "the complement of naturalism" and "the complement of idealism". The "mechanical determinism" of the naturalists and the "intellectual determinism" of the idealists are transformed by means of it into a "dynamical determinism". Starting from the side of indeterminism we arrive at an analogous conception. The freedom of the indeterminists, if it is to produce any effect, must not remain apart in the noumenal world, but must first make for itself a mechanism of causes and effects by which its ultimate end is to be attained; this mechanism becomes at last an organism, or "circular mechanism," of means adapted to proximate ends. From the point of view of development, freedom may be contemplated as gradually evolving itself from "reflex mechanism" through the stage of "inhibition" (of one "idea-force" by another) to "self-determination". The final conception of individual freedom is that of self-determination under the attraction of an idea of the universal good.

But for this ideal to be realised we must have complete knowledge of all the circumstances and consequences of our actions. So far as the result of an action is left to be determined by causes that are not within our knowledge, we do not act freely. Again, it is impossible, from the point of view of the individual, to arrive at clearness as to the limits of moral responsibility. There is no difficulty in finding a practical solution; but to find a complete theoretical solution we must pass on to the metaphysical question that finally presents itself.

Complete knowledge can only exist in the absolute; and the ideal of a freedom identical with perfect happiness in itself implies absolute existence and activity meeting with no obstacle outside. Even when we have established the possibility of freedom in this sense, the question occurs whether such a doctrine of freedom is not, after all, determinism. For determination in the absolute from complete knowledge is still determination. In the end we do not know whether there is freedom or necessity at the centre of things. And as we do not know what is the nature of reality so we do not know whether the ideal of freedom can ever be realised by human society. This ultimate doubt is to be solved by action.

From a point of view different from that which M. Fouillée seems here to take, a sufficient explanation of the ultimate doubt as to the future might be found in inadequate scientific knowledge of ourselves and of the world. This doubt, it might be contended, would remain even if we were convinced that the reality of things is necessity; it cannot, therefore, be connected with doubt as to the nature of reality. On the other hand, we might have adequate scientific knowledge of the whole series of causes and effects of our actions, and the metaphysical question might still be insoluble. The doctrine of freedom as "self-determination," although M. Fouillée prefers to develop it from suggestions in Leibniz, is essentially Spinoza's doctrine of freedom as action from adequate ideas: an advantage of developing it from Spinoza would have been the disappearance of the misleading term "free-will". It is, of course, separable from the author's metaphysics, for which, as he himself tells us in his Preface, he does not expect to gain general acceptance. If "the method of conciliation" seems to some extent to affect unfavourably M. Fouillée's statement of this doctrine, as well as his metaphysics, on the other hand we probably owe to it his theory of "idées-forces". This may be claimed as at least a very important contribution to philosophical terminology. Again, in the view taken of freedom as identical with happiness, and therefore at once the ultimate end and the essence of morality, not merely a means to future good or a form of all right action, there is an idea that is capable of much further application in ethics.

The difference between M. Fouillée's "persuasive ideal" of freedom and the ideal of those who accept the categorical imperative of Kant as the best expression of that feeling of obligation which seems to them to be the essentially ethical feeling, has close associations with a difference of opinion as to the origin of morality. Those who find this in a primitive sympathy ought to agree with M. Fouillée; those who assign less influence to sympathy and trace moral precepts to commands imposed when man was passing through the earlier stages of social evolution ought to prefer Kant's formula. The first of these views, it may be remarked, although M. Fouillée claims his

"more human" ideal especially for France, is that which has most frequently been taken by English thinkers.

T. WHITTAKER.

Grundriss der Psychologie. Von Dr. GUSTAV GLOGAU, o. ö. Professor der Philosophie an der Christian-Albrechts-Universität zu Kiel. Breslau: Koebner, 1884. Pp. vi., 235.

This volume, the author tells us in his preface, has grown out of "Dictate" or epitomes of lectures specially prepared by him for his students, and aims primarily at being a convenient text-book for these, though not without a view also to the wants of a wider public. It is interpolated as a sort of *Nebenstudium* in a more elaborate literary scheme, namely, a general outline of the several leading philosophical sciences, *Abriss der philosophischen Grundwissenschaften*, of which the first part appeared in 1880, as noted in MIND XX. 588, at the time. Written, in the first instance, for students, the chapters are clearly divided into sections and paragraphs, the drift of which is easily recognised by a glance at the table of contents. Better still, there are frequent references by number to preceding paragraphs, and less frequent to succeeding ones, which greatly help the reader in seizing the relations of part to part without a too great consumption of space. The style is for the most part plain and condensed, though now and again there seems to be a tendency to launch out into something more ornate and elaborate. It is hardly necessary to add that a good deal of knowledge of the subject is presupposed. In truth, the volume will prove a sealed book to one who has not previously made a careful study of the leading psychological doctrines of the day. Also, there are so many points only half opened up and barely touched on, that the reading of the work is apt now and again to tax the powers of even a well-read student. In this respect Dr. Glogau has effectually guarded himself against the supposition—which he distinctly contradicts in the preface—that his book is to serve as an easy hand-book for the mere examinee.

The volume consists of a short Introduction and three main Parts. Dr. Glogau begins by giving his own version of the place, scope and method of the science. Dogmatism which does not discriminate between empirical science and a critical construction of ultimate principles [Erkenntnisstheorie] is rejected, and the place of a strictly empirical psychology over against a spiritualistic on the one hand, and a materialistic on the other, firmly maintained. At the same time, Dr. Glogau sees that "psychology touches the problems of the nature of spirit, matter and God, in many ways and very closely, and has, indeed, to provide material for a special treatment of these problems in the theory of knowledge and metaphysic". The relation of physiology to psychology is briefly defined; the author illustrating by

a diagram the varying relation of accessibility in the physical and the psychical series of processes, low and high. Four different stages of self-consciousness and knowledge of mind are distinguished: (1) Practical knowledge, which springs unconsciously out of the natural communities, family, school, &c.; (2) Theoretic understanding, which presupposes permanent embodiments of mental life, literary memorials in which the mental experience of others is clearly and minutely depicted, and which, by a preliminary process of reflection and analysis, attains to a distinct empirical knowledge of mind and its various manifestations; (3) Genetic or historical understanding; and (4) Rational contemplation or Psychology proper.

Psychology, as here conceived, takes account of peoples as well as individuals. The author contends that it cannot begin with introspection or self-knowledge. The primitive mind is incapable of distinguishing subject and object, as this would presuppose. The individual man knows himself only in other men, that is, through and by means of the objective observation of others' actions, &c. And this emphasising of the fact that knowledge of mind is primarily knowledge of the collective or social mind, leads to a peculiar arrangement of the treatise. For while Part i. deals with the foundations and elements of mental life, and Part iii. with its special laws, Part ii. traces the main stages in the development of the collective human mind. It may, indeed, be said that this incorporation of *Völkerpsychologie* with general psychology is the most interesting feature of Dr. Glogau's volume. The English student will not fail to be struck by the similarity of the author's idea to the doctrine of the late G. H. Lewes, that psychology includes a sociological factor, and presupposes a body of historical knowledge. We will here only remark that the author appears to go too far in maintaining that knowledge of our own mind takes its rise in the observation of others. Rather would one say that knowledge of self and of others arise independently and proceed side by side, though, of course, each supplements and aids the other. And it may be added that even if, when considered historically, knowledge of others precedes knowledge of self, this fact would not necessarily show the proper order of psychological treatment to be that laid down by the author. For it may be contended that the first knowledge of others is still knowledge of individual minds; and, further, that, considered logically, or in order of rational dependence, knowledge of self is the *prius*, and, consequently, must be our starting point.

Part i. goes over a wide territory, touching many points of vital interest in a suggestive if somewhat hasty fashion. The organism and its several functions, the nervous system and organs of sense, the relation of the psychical to the nervous process, the threshold of sensation, differences of temperament, laws of emotional expression, the instinctive cravings or impulses, mental disturbances and diseases,—these are among the matters dis-

coursed of. Dr. Glogau has here succeeded in a remarkable way in packing a large amount of well-ascertained fact into a small compass. Yet here more than anywhere else, perhaps, the reader will be apt to regret that he is not able to supplement his reading by attendance at the author's lectures. The subject most fully dealt with is that of impulse, the nature and variety of which are set forth somewhat after the manner of G. H. Schneider.

Part ii., which deals with the broad features of the early developments of the human mind, is full of interest, and one almost wishes that Dr. Glogau had made this the special subject of his treatise. The sketch here given is offered as an abstract construction, based on the essential motives which disclose themselves in historical reality, but making no pretence to close correspondence with the concrete facts of history. Here we have a clear survey of early social developments, the institution of the family and the tribe, and the primitive organisation of the folk-mind. Then follows a sketch of the evolution of language and of mythology, which prepares the way for a brief glance at the higher stages of intellectual and moral progress in the conscious mental life of historical peoples. The author brings to these large and imposing topics not only the results of careful reading but a certain imaginative glow, which is appropriate enough and offers an agreeable relief to the more abstract and technical passages of the volume. No one who reads this part can fail to see how much psychology has to gain of large human interest by the assimilation of the results of anthropological and other related branches of research.

In Part iii., Dr. Glogau takes up the special laws of mind —coalescence, separation, mutual hindrance, and so forth, of psychical elements. Here we see more clearly than in the earlier portions the influence of Herbart's thought, which seems to have been the most potent factor in determining the author's psychological stand-point and aims. The transition from the half-poetical reconstruction of early human consciousness to the dry scientific analysis of the mechanism of intellection strikes one as a little harsh. And, indeed, it is difficult to see why a general statement of psychical laws was not given at the outset, so that the exposition might have passed at once from the amount of the rude products of the primitive mind to a detailed description of the more varied and more intricate processes of observation, imagination, and thought of the civilised man. What makes the order of treatment at this point appear the more arbitrary is the little reference throughout Part iii. to the preceding one. Part iii., in fact, attaches itself not to its immediate predecessor but to Part i. Waiving this, however, one may give to this Part iii. unstinted praise. The intricate mechanism by which ideas are formed, the laws of association, the several forms of apperception, are all set forth in a masterly way. Brief statement is eked out by symbols

and formulas, in the choice of which the author shows great skill. Of special interest is the treatment of the process of unification in grouping a number of sense-elements into percepts. This result is attributed to the work of "productive imagination," from which is distinguished the higher function of phantasy, which enters into the organisation of a number of single images into general notions. A concluding chapter provides an excellent epitome of the development of the ideas of space and of time, and the differentiation of subject from object consciousness. Here special mention may be made of the clear account of the way in which, by means of what is called the "constructive movement" of the eye, the mind arrives at a distinct presentation of space as a collection of co-existent parts. Dr. Glogau has thoroughly assimilated the valuable portions of the Berkeleyan doctrine of vision, and shows, in an interesting way, how touch contributes to the development of clear perception of distance and magnitude.

JAMES SULLY.

Ueber das Gedächtnis. Untersuchungen zur experimentellen Psychologie. Von HERM. EBBINGHAUS, Privatdocenten der Philosophie an der Universität Berlin. Leipzig: Duncker & Humblot, 1885. Pp. ix., 169.

If science be measurement, it must be confessed that psychology is in a bad way. It is true that the borderland between psychology and physiology, conveniently termed psychophysics, has already reached the stage where empirical generalisations have been raised into quantitative relations. Hitherto, however, purely psychical phenomena, apart from physical reference, have evaded the skill, or perhaps not engaged the attention, of the calculator except in a few sporadic investigations by Mr. Galton and Prof. Wundt. Even Sig. Buccola's exhaustive summary of what is known about the temporal relations of mental operations (*La Legge del Tempo*, Milan, 1883) never for a moment deserts the field where movements of mind can be compared with the extensive relations of physical objects. Dr. Ebbinghaus's investigations on memory may claim to be the first on any considerable scale in which quantitative relations have been obtained for psychical facts, apart either from physiological concomitants or physical reference. They therefore deserve, and will repay, the attention of earnest students of psychology.

The method employed by the author has been to investigate the conditions under which he could reproduce without error a number of 'nonsense verses,' of the type *baf dek fil, gom hum jär, köp lür maus, neit peuch rosch*, with all combinations of these consonants and vowels. He claims for the use of such materials the advantages of simplicity and uniformity and the absence of dis-

turbing association, while he is further enabled to examine the last in its simplest form of auditory association. He investigates, so to speak, the raw material of memory, and gains glimpses of the ground-plan on which the fair fabric of mind is erected. The variables which lend themselves to measurement are the number of syllables constituting the 'verses,' the number of repetitions required to reproduce them, the time elapsing between learning and relearning, and, finally, the time saved in the latter process owing to the associations formed between contiguous members of the rows of syllables. The amount of mental work involved is at times reckoned in seconds, at times in numbers of repetitions, the latter being measured during each lesson by moving the beads of a kind of abacus or rosary. This variation of methods causes some confusion and want of uniformity in the results, though Herr Ebbinghaus gives tables to reduce the one to the other, the average time taken for the pronunciation of each syllable being 0·4″, or at the rate of 150 per minute. It seems desirable, when the investigations are continued, that the number of repetitions should be taken as the measure, especially as time appears as a variable in other parts of the inquiry. When we add that Herr Ebbinghaus has been careful to calculate the 'probable error' of each of his results, the chief points in the method employed have been indicated, and attention may be directed to the results obtained. Over a third of the book (Sections i.-iv. pp. 1-61) is taken up with remarks on memory in general, Comtian objections to introspection, the law of error, and the trustworthiness of results. Considering the class of readers who are likely to use the book, much of this might have been curtailed with advantage. But we must be content to accept the disadvantages of Teutonic thoroughness along with its many advantages.

The actual investigation begins in Section v., devoted to the "Time spent in learning Rows of Syllables regarded as a function of their Length". Our author presents two series of investigations, separated by over three years, but giving results remarkably uniform. Combining the two (pp. 64 and 67), we get the following relations between the number of syllables and of repetitions required to reproduce them (probable error here, as elsewhere, being neglected) :—

Syllables.	Repetitions.	Syllables.	Repetitions.
7	1	16 (mean)	31
10	12	19	38
12	16	24	44
13	23	26	55

Excepting a rise in the number of repetitions required, the author does not deduce any quantitative law from these results. It is surprising that he has not made use of the obvious expedient of reckoning only the number of syllables above a certain minimum (in his case 6), which could be learnt without repetition, and

might be regarded as the 'threshold' value. Subtracting this, the following relations would hold between the surplus syllables and the quotient formed by dividing the number of repetitions by this :—

Surplus syllables (over 6).	Repetitions divided by syllables.	Surplus syllables.	Quotient
		10	3·1
4	3·0	13	2·9
6	2·7	18	2·6
7	3·3	20	2·7

This gives the general law that the number of repetitions required is treble the excess of the syllables over the 'threshold'. The general tendency towards a fall with the higher numbers, which is opposed to expectation and to our author's statements, may be due to the fact that the threshold is temporarily raised after the first few repetitions. When 24 or 26 syllables are learnt, the first 10 become fixed in memory after the first dozen repetitions, and thus become a new threshold for the remaining repetitions in this particular series of observations. It would also have been desirable in this connexion to determine the upper limit of the power of reproducing senseless sounds. There must be for each subject a number of syllables which would require an infinite number of repetitions to effect perfect retention of them, *i. e.*, they could never be learnt. The determination of these two limits would be of practical utility in pædagogics. This part of the book is concluded with the remarkable result that on applying the same method to significant language (stanzas of *Don Juan*) the time taken to retain series of 80 syllables was only one-tenth of what it would be with non-significant syllables.

Section vi. deals with "Memory as a function of the Number of Repetitions". The length of the verses here remains constant, six of 16 syllables, and these were repeated 8, 16, 24, 32, 42, 53, 64 times. The verses were then relearnt 24 hours afterwards, and the time saved in the second lesson noted. The author somewhat naïvely remarks that he did not think it desirable to attempt more than 64 repetitions, as even this took up more than three-quarters of an hour. It may be added that this investigation alone must have taken, I reckon, more than 22 hours of the most exhausting mental labour. The results are remarkably uniform, each repetition saving on an average 12·7″. Thus, to take a couple of examples, whereas without repetition the 96 syllables were learnt on the following day in 1270″, with 24 repetitions at the first lesson they were learnt next day in 975″, and with 64 in 454″;—a saving of 295″ in the first and of 816″ in the second case, 12·3″ being saved for each repetition in the first instance and 12·8″ in the second. This is equivalent to a saving of about one-third the original time of learning, or one repetition was saved out of every three, whatever the number of repetitions. A different set of four longer investigations, each of no less than

410 repetitions of 72 syllables, gave only a saving of one-sixth, a remarkable result, which requires more discussion than the author has given to it, or can be spared for it here.

Turning to the next Section, on "Memory and Forgetfulness as functions of Time," we find the same measure utilised, the results being calculated according to the saving of time effected in re-learning 104 nonsense syllables after various intervals. The following Table gives the chief results, the first column giving the time elapsing between learning and relearning, the second the percentage of time saved in the latter operation, which we might term the 'modulus of memory,' the complementary percentage giving that of forgetfulness, which can easily be supplied.

Time elapsed.	Percentage saved.	Time.	Percentage.
20′	58·2	1 day	33·7
1 h.	44·2	2 „	27·8
8 h. 48′	35·8	6 „	25·4
		31 „	21·1

From these figures the author deduces the general formula—

$$m = \frac{100k}{(\log t)^c + k}$$

where m is the 'modulus of memory,' t the time-interval between learning and relearning, and c and k personal constants, which in the author's case are respectively 1·25 and 1·84. Putting f for $100 - m$, or the 'modulus of forgetfulness,' we obtain the simple relation $\frac{m}{f} = \frac{k}{(\log t)^c}$, *i. e.*, the amount retained is to that forgotten inversely as the logarithm of the time interval.

The next Section is a sort of combination of the preceding three, dealing with the effects of repeated learning of different numbers of syllables at intervals of 24 hours, the process being carried on during a week. The following may be selected as the table giving most information :—

Syllables.	Number of Repetitions required to learn on given days. I.	II.	III.	IV.	V.	VI.
12	16·5	11	7·5	5	3	2·5
24	44	22·5	12·5	7·5	4·5	3·5
36	55	23	11	7·5	4·5	3·5
Stanza of *Don Juan* (80)	7·75	3·75	1·75	0·5	0	0

The first differences of these numbers would yield in the second and fourth lines geometrical progressions with common ratio approximately $\frac{1}{2}$, but the first and third lines do not yield such simple relations. Comparing this with the results of repeated repetitions on the same day, the popular practice is justified which prefers to take lessons in doses on successive days, when the time saved is about one-half, rather than to continue the repetitions on the same day, which would give only an advantage of one-third or

sometimes even only of one-sixth (Section vi.). Mr. Prendergast's 'mastery' method of learning languages is founded on this principle.

Section ix., the last, attempts to determine the relation of retention to the associations formed during learning. The associations here considered are merely auditory and thus differ from the significant ones investigated by Mr. Galton in his psychometric experiments (*Inquiries*, p. 199). It must have caused our author some trouble to fix upon a method to determine the associational linkages of his intractable materials. The one he has hit upon is to form new rows of syllables by skipping one or two or three syllables in his verses. Thus from the verse given above he could form new ones of the types *baf fil hum*, *köp maus peuch*, &c., *baf gom köp*, &c., *baf hum maus rosch*, &c. The saving of time thus effected as compared with learning entirely new verses is given in percentages of the original time taken in learning, and may be expressed in the following Table, where the Roman figures give the number of syllables skipped and the last rubric refers to a case where only the first and last syllable of each row was retained, the remainder being arbitrarily permuted. The number of syllables learnt was 96, six rows of 16 syllables; these could be relearnt when unchanged with a saving of 33 per cent. of the original time. The influence of association is shown by the relation of the following numbers to this figure rather than to 100: one ought perhaps to treble them.

New Series.	Time Saved.	Series.	Time.
I.	10·8	VII.	3·3
II.	7·0	Permutation.	0·5
III.	5·8		

It may be remarked that the probable error in this case is exceptionally large and the results proportionately uncertain. The general result reached is not of very startling novelty: associations are formed with all the series of intensity varying directly with contiguity. Other experiments seem to show that there is a kind of rhythm in associations, the odd syllables being more likely to be retained than the even.

Such is the method and such the main conclusions of this remarkable series of investigations, remarkable, it is perhaps needless to observe, more for their method than for their results. Indeed the irreverent critic might be tempted to remark that the results obtained scarcely seem calculated to set the Spree on fire. That it takes a relatively longer time to learn a longer set of verses; that the more you repeat mnemonics, the better you retain them; that you forget more as time goes on; that it is better to have spells of repetition at intervals than go on repeating till brain is weary and attention distraught; that associations are formed with strength varying according to the contiguity of the associated images—results like these scarcely seem to need

two years of strenuous and exhausting labour to establish. But it almost invariably happens with statistical inquiries that the earliest results reached are mainly confirmatory of the rough averages which we term impressions and only have the additional advantage of determining the *how much*. It is rather from the subsidiary results that new generalisations emerge which were previously unsuspected. As the chemist finds his new compounds in the rubbish of the retort, so the statistical inquirer finds his new truths in the *débris* of investigation. Herr Ebbinghaus is very sparing in hints as to the direction in which we may expect psychological novelties from his investigations; he is almost ostentatiously cautious in keeping close to details. His reticence tempts one into speculations as to the future of the new branch of psychometry which he has opened up. May we hope to see the day when school registers will record that such and such a lad possesses 36 British Association units of memory-power or when we shall be able to calculate how long a mind of 17 'macaulays' will take to learn Book ii. of *Paradise Lost*? If this be visionary, we may at least hope for much of interest and practical utility in the comparison of the varying powers of different minds which can now at last be laid down to scale. Herr Ebbinghaus's results are as yet personal, but we are glad to learn from his preface that he is now engaged on the wider and more promising field of comparative work, the harvest of which will be anticipated with impatience. Meanwhile let us not part from him without a word of recognition for the astonishing patience, painstaking diligence, and scientific caution and accuracy shown in his work, qualities which one takes as a matter of course in a *Privatdocent* of a German university, but which would be regarded in any other case with wonder and admiration.

JOSEPH JACOBS.

VIII.—NEW BOOKS.

[*These Notes (by various hands) do not exclude Critical Notices later on.*]

Francis Bacon: An Account of his Life and Works. By EDWIN A. ABBOTT, D.D., Author of *Bacon and Essex* and Editor of Bacon's *Essays;* formerly Fellow of St. John's College, Cambridge. London: Macmillan & Co., 1885. Pp. xxxix., 508.

The author, who had previously done good work upon Bacon, has ended by writing this considerable volume when he started with the design of compressing all he had to say within the compass of a short "Literature Primer". It is an independent account of Bacon's life, character and works, and has features that give it no small interest and value. After an argumentative "Introduction" (pp. v.-xxix.), turning chiefly upon a disputed incident in the Chancellor's judicial career, it gives, first, a summary of "Events in Bacon's Life and Times" (pp. xxxi.-ix.) which, besides being otherwise useful, helps to fill in those parts of the following narrative that are (as in the closing years) less adequate than they might be. The "Life" fills 331 pp., and, if it does not give evidence of special familiarity with the political history of the period which it covers, yet presents a view of Bacon's action throughout that is always well considered and often shows genuine insight. Especially notable is the final statement of the "problem" of Bacon's character, with the "solution" that his moral derelictions (1) were justified in his own eyes "by the hope that if he rose to eminence in the State he should have a larger command of industry and ability to help him in his philosophic work"; (2) did not appear such, because of his high estimate of his own character, sustained not only by his "consciousness of vast plans of universal philanthropy, but also by an habitual inaccuracy of mind combined with an unusually sanguine disposition," making him "always take the most favourable views of everything that concerned himself". Here, especially with his second point, Dr. Abbott surely transfixes the mark. Part ii., "Bacon's Works," without pretending to go very far into scientific or philosophic matters, is comprehensive and instructive; there is only, at p. 410, a somewhat uncalled-for outburst against that deeper kind of philosophical inquiry which is not therefore to be made light of because Bacon had no aptitude for it. After some Appendices, more or less philosophic in character, the book ends with an Index that is most happily redolent of Bacon at his best—as the master of all who write.

M. Tulli Ciceronis Academica. The Text revised and explained by JAMES S. REID, M.L., Fellow and Assistant Tutor of Gonville and Caius College, Cambridge; University Lecturer in Roman History. London: Macmillan & Co., 1885. Pp. x., 371.

Mr. Reid in putting forth this elaborate edition of Cicero's treatise expresses the opinion that "there is no ancient philosophical work which ought to be of greater interest to modern students of philosophy, and particularly to English students, than the *Academica*". The arguments of the New Academy against dogmatism are, he contends, essentially identical with the most important sceptical arguments of modern times; and the Stoic reply that the criterion of certitude is simply our conviction of the truth of our impressions is the only reply that it has

ever been found possible to make to the sceptical position. He protests against the excessive depreciation of Cicero as a philosopher by recent historians, explaining it by political partisanship. Cicero, he contends, was essentially not a politician but a man of letters. He was not an original philosopher; but he had profound philosophical learning; and in his time no one sought for originality in philosophy. The question of Cicero's accuracy as a translator and interpreter of the Greeks does not seem to the present editor to be settled; but from his own studies he has formed a very favourable opinion of it; "confirmations of Cicero's accuracy," he says, "often come to light in the most unexpected quarters". He argues that the defects of bad arrangement, want of lucidity, &c., with which Cicero has been charged, may very well be due to his Greek originals; probably nothing but the framework of the dialogues, "the local scenery, the illustrations from Roman history and the connecting links" are of his own invention. Mr. Reid's historical discussion of the philosophical schools of the age of Cicero and his relations to each of them as well as to individual teachers is very full.

Works of THOMAS HILL GREEN, late Fellow of Balliol College, and Whyte's Professor of Moral Philosophy in the University of Oxford. Edited by R. L. NETTLESHIP, Fellow of Balliol College, Oxford. Vol. I. *Philosophical Works.* London: Longmans, Green & Co., 1885. Pp. xxvii., 541.

This edition will include all Green's printed works except the *Prolegomena to Ethics* (Oxford, 1883), and also a selection from his unpublished papers. The promise, in another volume, of such new matter is hardly more welcome than the collection, in the present one, of his two Introductions to Hume, with his later Articles on contemporary English psychology, as represented by Lewes and Mr. Spencer. It is well to have the famous 'Introductions' in accessible form, apart from Hume's works, and it would very usefully lighten an otherwise excellent edition of Hume if in future it should be issued without the 'Introductions' that made it so unwieldy. The later Articles, filling about a third of the present volume, are five in number, including the one (v.) in which Green replied to Mr. R. Hodgson's defence of Mr. Spencer, and one (iv.), on Lewes's doctrine of the Social Medium, that has not been previously published, being withheld, at the time when it was written (1878), on account of Lewes's death. "In reprinting, a few obvious corrections have been made in the text, and the division into sections and marginal analysis, which the author had made for the 'Introductions' to Hume, have been continued through the rest of the volume," except in the case of Article v.

The Logic of Definition: Explained and Applied. By WILLIAM L. DAVIDSON, M.A., Minister of Bourtie. London: Longmans, Green & Co., 1885. Pp. xxiv., 353.

The author of this work has endeavoured (1) to formulate and expound the principles of Definition and (2) to apply them. The spheres of application are mainly—the Dictionary, the School-book, Philosophical Vocabulary, Philosophical Questions, and Taxological Biology. He has kept constantly in view the wants of the student of philosophy and of the teacher, seeking also to be helpful to Dictionary-compilers and writers of educational manuals. An Appendix (pp. 319-30) gives some account of Boëthius with an abstract of his *De Divisione.* Some discussions now incorporated with the work have appeared in past numbers of MIND. Critical Notice will follow.

Civilisation and Progress: being the Outlines of a new System of Political, Religious and Social Philosophy. By JOHN BEATTIE CROZIER. London: Longmans, Green & Co., 1885. Pp. 453.

The "New Organon" (Part i.) is the study of the mind as a concrete whole, in the manner of the "seers," such as Carlyle: this method the author aims at reconciling with the scientific method of Comte and Mr. Spencer. "The Goal" (Part ii.), "the end that Nature has at heart," is "the expansion and elevation of the individual mind". "Liberty and expansion are ends in themselves, order and duty are only means." The error of Comte's politics was that, instead of the elevation and expansion of the individual, he made the order and stability of society as a whole his chief concern. In Comte's view of religion (Part iii., "The Religion of Humanity") there is "a confusion of planes". "Religion, in its true and final form, will have no effect on Action, but will be restricted to giving that harmony and satisfaction to the Intellectual, Moral and Emotional sides of our nature, which is necessary to their balanced and healthy activity." (Part iv., "Religion".) Its object must in the end be "a divine mind behind the world"; it cannot cease to be in some sense anthropomorphic. The last two Parts of the book (v., "Government," vi., "Theory of Progress") are chiefly concerned with more special political theories. "The material and social conditions of men" are, the author holds, "the controlling factor in civilisation and progress". "Mr. Spencer, by attaching the problem of Civilisation to a remote, abstract and impersonal law of Nature, rather than to immediate, human and concrete causes, has left the problem still unsolved." On the other hand, civilisation is not to be best advanced, as Comte held, "by primarily addressing the hearts and imaginations of men, by appeals to their consciences and exhortations to duty and self-sacrifice"; but "by ameliorating the material and social conditions of men, in the belief that, out of the improved conditions, the higher morality will arise of itself".

The Social Philosophy and Religion of Comte. By EDWARD CAIRD, LL.D., Professor of Moral Philosophy in the University of Glasgow. Glasgow: James Maclehose & Sons, 1885. Pp. xx., 249.

The central principle of Comte's philosophy ("the vital spot," "the Achilles' heel") is the idea of a "subjective synthesis". This idea is an advance on the individualism of Locke and Hume with which Comte started, and from which critics of his system such as Littré and Mill never escaped; but because he was unconscious of the philosophic movement of which he formed part, of his real agreement with modern "metaphysicians," who, equally with himself, reject the abstract individualism of the last century, his synthesis remained imperfect. His imagination had, indeed, escaped from the presuppositions of his understanding, and in the adoration of space and of the earth "optimism, which is rejected at the beginning as truth, is brought back in the end as poetry". But this optimism can be theoretically justified; for, when we once depart from the purely individual point of view and, with Comte, regard man as the reality and the individual as a mere abstraction, we are compelled to seek a higher unity in which the opposition of Nature and Humanity also disappears. Comte's position resembles Kant's; it is intermediate between the philosophy of the last century and that of Kant's idealistic successors. Inferior to Kant in power of speculative analysis, Comte was able to give a kind of insight into the social needs of modern society such as we could not expect to gain from Kant. The defect of his synthesis is that it is not "subjective" and not "relative" enough. A step further would have brought him to see the identity of a complete subjective synthesis with an

objective synthesis, and to the doctrine of a relativity in which humanity itself is seen as an organic part of a larger whole. When this position is attained it is no longer necessary to deny the reality of the individual; for, if the individual can only exist as a unit in the social organism, humanity on the other hand can only find its realisation in the individual. Through not recognising this, Comte is unjust to Protestantism and to the revolutionary movement, regarding them as exclusively negative, while they had really a positive value, in so far as they reaffirmed the direct relation of the individual to the unity of the whole. His historical treatment of Christianity is, again, defective, because he recognises only its monotheistic and not its "pantheistic" element, *viz.*, the doctrine of "reconciliation with God, and therefore with the world and self, which is alien to pure monotheism". When the identity of a complete subjective with an objective synthesis has become clear, we see that science left to itself tends to unity, that there is no need to impose on it an artificial unity; intellect is not, as Comte says, essentially "dispersive," but might with equal plausibility be represented as tending to a premature synthesis: again, the absolute opposition, supposed by Comte, between intellect and emotion, is a remnant of that "abstraction" against which he himself, in common with idealistic metaphysicians, protests. In conclusion, Prof. Caird acknowledges, notwithstanding all this criticism, the value of much of Comte's teaching, and especially of that which is contained in the *Politique positive*. "Controversy itself," he remarks, "is a kind of homage; for, as Hegel says, 'It is only a great man that condemns us to the task of explaining him'."

Plato and the other Companions of Sokrates. By GEORGE GROTE, Author of the *History of Greece*. A New Edition in Four Vols. London: John Murray, 1885. Pp. xxx., 457; xxiv., 428; xxii., 426; xix., 419.

"In the present Edition, with a view to the distribution into four Volumes, there is a slight transposition of the author's arrangement. His concluding chapters (xxxviii., xxxix.), entitled 'Other Companions of Sokrates,' and 'Xenophon,' are placed in the First Volume, as chapters iii. and iv. By this means each Volume is made up of nearly related subjects, so as to possess a certain amount of unity. Volume First contains the following subjects:—Speculative Philosophy in Greece before Sokrates; Growth of Dialectic; Other Companions of Sokrates; Xenophon; Life of Plato; Platonic Canon; Platonic Compositions generally; Apology of Sokrates; Kriton; Euthyphron. Volume Second comprises:—Alkibiades I. and II.; Hippias Major—Hippias Minor; Hipparchus—Minos; Theages; Erastæ or Anterastæ—Rivales; Ion; Laches; Charmides; Lysis; Euthydemus; Menon; Protagoras; Gorgias; Phædon. Volume Third:—Phædrus—Symposion; Parmenides; Theætetus; Sophistes; Politikus; Kratylus; Philebus; Menexenus; Kleitophon. Volume Fourth:—Republic; Timæus and Kritias; Leges and Epinomis; General Index. The Volumes may be obtained separately."

Myths and Dreams. By EDWARD CLODD, Author of *The Childhood of the World, Jesus of Nazareth, &c.* London: Chatto & Windus, 1885. Pp. 251.

Myths, of which examples are selected from all sources, are explained (Part i., pp. 1-139), chiefly from the anthropological point of view, as the product of the modes of thought of primitive man (assumed to be analogous to those of modern savages and of the less cultivated classes of civilised nations). In Section 4 ("The Solar Theory of Myth") the author accepts, in part, the theory of philologists as to the common

origin of some groups of Aryan myths, but contends that, in trying to explain all the details of an epic poem, for example, as parts of a sun or dawn myth, they neglect an element that ought to be taken into account, *viz.*, the tendency, when once a myth has been formed, to invest its personages with an independent human interest and, consequently, to modify the incidents of the story. This element has taken the chief place in the Homeric poems, while "in the *Veda* the primitive nature myth, although exalted and purified, is persistent". Strictly speaking, however, the *Veda* is not primitive, but is the product of a relatively high civilisation. Sections 2 and 3 of Part ii. ("Dreams," pp. 143-244) are devoted to "Limitations of Barbaric Language" and "Barbaric Confusion between Names and Things": the rest is concerned with the barbaric theory of the soul, the various beliefs derived from it, and the modifications it has undergone from the stage of "primitive animism" to modern times. The more special object of the book is to explain from the primitive interpretation of dreams the origin of beliefs in the supernatural.

Theosophy, Religion and Occult Science. By HENRY S. OLCOTT, President of the Theosophical Society. With Glossary of Eastern Words. London: G. Redway, 1885. Pp. xiii., 384.

The joint-founder (with Madame Blavatsky) of the Theosophical Society, which since its origin in 1875 has won so much public notoriety, here brings together, with some "Forewords" and an introductory chapter "Theosophy or Materialism—Which?", eleven addresses which he has delivered within the last five or six years, mostly in India, on the nature and aims of a movement that professes to be at once scientific, philosophic and religious. Col. Olcott appears in these pages as an earnest man of the apostolic sort, with no mean expository, or at least hortatory, gift. He is not unacquainted with the later phases of English philosophical thought, and he has satisfied himself that modern thinkers and scientific men are babes, in respect of insight and effective power over nature, as compared with the ancient Indian sages; whose wisdom has been transmitted by occult channels through a succession of favoured or superior individuals till the present time, when the signs declare that it may become the heritage of a larger portion of humanity (from India outwards) and accomplish the regeneration of the race. The book is very well fitted by its frank disclosures to make plain to any readers whether they are of those to whom salvation is to come by this new-old way and who should think of treading it farther.

Thoughts on Science, Theology and Ethics. By JOHN WILSON, M.A., Trinity College, Dublin. London: Trübner & Co., 1885. Pp. 197.

The result of the three chapters on Science, its use and its methods (Part i.) is that scientific and theological modes of thought are, "from the nature of things, incompatible". In Part ii. (on Ethics, its object and scope, the origin, nature and sanction of the moral code) the author defines ethics as "the science of social conduct". The rules of social conduct are found to have arisen from "the necessity of social co-operation". The really effective sanctions of these rules, or of "the moral code," are the legal and the social sanction, together with "the subjective sanction"; the supernatural sanction has had little or no influence on morality when it has not had an evil influence. If we take Religion in the theological sense of worship of "a man-like ghost," science can have nothing to do with religion; "but accepting as a definition of the word *religion*—the obligation or sense of duty which rests on the minds of men arising from the felt relation in which they stand to some superior Power, it becomes possible for science to have a religion".

The Common Sense of the Exact Sciences. By the late WILLIAM KINGDON CLIFFORD. With 100 Figures. ("International Scientific Series.") London: Kegan Paul, Trench & Co., 1885. Pp. xiii., 271.

The editor of this volume, "K. P.," explains that it was originally (from about 1875) to have been entitled "The First Principles of the Mathematical Sciences explained to the Non-Mathematical," and got its present name from the author only shortly before his death in 1879. There were to be six chapters—on Number, Space, Quantity, Position, Motion, Mass. Of these, Clifford left only the first, second and fifth, with part of the third. The present editor, who took up the task of preparing the book for press when it fell from the hands of the late Prof. R. C. Rowe, has sought, in conformity, as far as possible, with the author's spirit, to complete the account of Quantity, to treat of Position (pp. 147-226), and, in lieu of the other non-extant chapter on Mass, to supplement the account of Motion, in c. 5, with two short sections on the Laws of Motion and on Mass and Force. His work in these extensive additions and otherwise throughout the volume has certainly been far from light, and deserves all acknowledgment. Clifford's own exposition is marked by all his well-known characteristics, but does not appear to contain anything novel, in point of *principles*, beyond what it contained in his "Philosophy of the Pure Sciences" at the end of Vol. i. of his collected *Lectures and Essays.*

Physical Expression, its Modes and Principles. By FRANCIS WARNER, M.D. Lond., F.R.C.P., Assistant Physician and Lecturer in Botany to the London Hospital, formerly Physician to the East London Hospital for Children. With 51 Illustrations. ("International Scientific Series.") London: Kegan Paul, Trench & Co., 1885. Pp. xx., 372.

The term "expression" in this book denotes all movements that are signs of any state whatever of an organism animal or vegetable; but it tends to become restricted in practice to movements that denote states of organic life rather than of mind. The author, however, desires by observation and analysis of "all physical phenomena coincident with the manifestation of mind" to supply "a preliminary stepping-stone" to the study of mind itself. For "mind" he would prefer to substitute the term "mentation," by which he intends to describe all processes in the brain that are accompanied by mental activity, without any hypothesis as to the nature of this activity in itself. The characteristic of the present set of researches is that, both by modified forms of the graphic method of studying movements already employed by other experimentalists and by the study of postures, he seeks to describe as accurately as possible various nutritive states of the organism; movements and postures, for example, of the hand ("the energetic hand," "the nervous hand," &c.,) in health and in disease, in a low and in a high state of energy, in the sane and in the insane, being all referred to a normal or abnormal state of nutrition. Even in studying actions that are considered as signs of "mind" and not simply of "life," it is the modifications produced by different nutritive states of the brain that are analysed, rather than the nature of the movements as determined by the idea or feeling they express. These researches may on the whole be considered as preliminary to researches such as those of Darwin in which movements of expression are considered in relation to the ends they subserve, rather than as a stepping-stone to psychology in general. Subjective psychology the author does not profess to take into account; he denies that there is any means of learning anything about "subjective conditions" except study of their physical manifestations. A special feature of the work is that much attention is devoted to the movements of expression in children.

Knowledge and Reality. A Criticism of Mr. F. H. Bradley's *Principles of Logic.* By BERNARD BOSANQUET, M.A., Late Fellow and Tutor of University College, Oxford. London: Kegan Paul, Trench & Co., 1885. Pp. xi., 333.

The author, who wrote at some length on Mr. Bradley's doctrine of "Fact and Inference," in MIND XXXVIII., here offers a series of studies on other questions raised in the *Principles of Logic;* confining himself to topics of properly logical import. Mr. Bradley, he thinks, while being an effective pioneer in the present forward movement of English philosophy which seeks to assimilate what is really great in European philosophy, has, in some external matters and in some that are more than mere externals, attached himself, perplexingly, to writers of the present reaction in Germany, which, however it may serve a useful purpose there, can only work harm here if sympathy with it should restore the rule of traditions that we are just beginning to lay aside. The object, accordingly, is to show how Mr. Bradley's essential and original conception may be disengaged from some peculiarities which he apparently shares with reactionary logic; also, in any case, to call attention to the leading ideas of a work "which deserves to be epoch-making in English philosophy".

The Fundamental Science. By HENRY JAMES CLARKE, A.K.C., Vicar of Great Barr, &c. London: Kegan Paul, Trench & Co., 1885. Pp. xxiv., 265.

"The fundamental Science" is concerned with the Infinite,—"a kind of existence which the conditions of our intellectual constitution preclude us from defining in relation to either Time or Space," but which can be "conceived" although not "imagined". No phenomenal series of causes and effects is complete in itself; hence the phenomenal, the manifold, can only be explained as having its origin in "a Cause, Single, Simple, and Eternal". Unless the Infinite is created by the mind which conceives it, it is recognised as something that *is.* "My recognition of it presupposes that it is cognoscible. If it is cognoscible, it may be expected to yield materials susceptible of investigation and available for the construction of a Science" (c. i., "Cognoscibility of the Infinite"). The creation of the world by the infinite Cause is to be conceived as a creation out of potentiality, not out of nothing (c. ii., "Origination"). The infinite Cause must be a "fundamental Will" (c. iii.), having a purpose which can be characterised as "all-comprehending plan" (c. iv.); further, the human mind, being able to make the distinction of *ought* and *ought not* "has the capacity for ascribing to the Fundamental Mind an *ethical* character" (c. vi.). Several chapters are devoted to discussion of the "Possibility of the Revelation of the Fundamental Mind" (c. v.), "Testimonies to a Specific and Unique Historical Revelation" (c. vii.), "Divinely authenticated Signs and Wonders" (c. viii.), "Incarnate Manifestation of the Fundamental Character" (c. ix.), "Providential Character of the Fundamental Government" (c. x.). Lastly some "Eschatological Conclusions" are drawn in the sense of liberal theology (c. xi.).

Properties of Matter. By P. G. TAIT, M.A., Sec. R.S.E.; formerly Fellow of St. Peter's College, Cambridge; Professor of Natural Philosophy in the University of Edinburgh. Edinburgh: A. & C. Black, 1885. Pp. viii., 320.

The author, in the midst of his useful physical work continued in this volume, is as amusing as ever on the subject of the "metaphysicians," and has pressed one of them into the service of his playful humour. In an Appendix, pp. 286-91, Professor Flint furnishes a statement of twenty-five "Hypothe-

ses as to the Constitution of Matter," described by Professor Tait himself, p. 12 n., as "a remarkable collection of such (now historical) speculations". "Now historical" is not meant for praise, and is a little hard upon Sir W. Thomson, who is one of the offenders. Professor Tait has also taken to quoting Kant, but evidently not with comfort, and is apt to drop him incontinently. There is some very queer "metaphysics" of his own in chap. i. "Introductory"; and his logic might be better. Thus we read at p. 4: "The objectivity of energy is virtually admitted in a curious way, by its being advertised for sale"; but on p. 11 it is said: "To 'have its price' is not conclusive of objectivity, for we know that Titles, Family Secrets and even Degrees are occasionally sold". This is not good logic.

Scientific Romances, No. I. "What is the Fourth Dimension?" By C. H. HINTON, B.A. London: W. Swan Sonnenschein & Co., 1884. Pp. 32.

A very suggestive and well-written speculation, by an inheritor of an honoured name. Urging the importance of supplementing "mechanical science by a just consideration of the constitution of the knowing faculty and the conditions of knowledge," he prefers not to ask directly, 'What is knowledge?—What constitutes experience?' but to get out "beyond the horizon of actual experience" by the other way of "questioning whatever seems arbitrary and irrationally limited in the domain of knowledge": in the present case, the limitation of the dimensions of space to three. He works out the main properties of four-dimensional space, as far as they can be inferred by analogy from the relation there is between actual space and (abstract) space of fewer dimensions, and then tries, in different ways, to determine "what relations beings in four dimensions, if they did exist, would have with us". Here is an interesting specimen of his manner:—"If we are in three dimensions only, while there are really four dimensions, then we must be, relatively to those beings who exist in four dimensions, as lines and planes are in relation to us. That is, we must be mere abstractions. In this case, we must exist only in the mind of the being that conceives us, and our experience must be merely the thoughts of his mind—a result which has apparently been arrived at, on independent grounds, by an idealist philosopher".

An Analysis of the Principles of Economics. Part I. By PATRICK GEDDES. Read before the Royal Society of Edinburgh 17th March, 7th April, and 7th July, 1884. London: Williams and Norgate, 1885. Pp. 40.

The author's aim is to treat the subject matter of economical science (which is to be regarded as essentially a social science) according to the method of each of the preliminary sciences in succession. From the point of view of physics (c. i.) producers and consumers are to be regarded as producing and consuming mechanisms; the result of this mode of consideration is that a far larger amount of productive labour has pleasurable stimulation ("aesthesis") for its end than bare preservation. The introduction of biological considerations (c. ii.) shows how production may bring about either development or degradation of the individuals who produce and consume. In c. iii. ("Psychological Principles") the author argues that altruism as well as egoism must be taken into account by economical science among the motives of production.

Profound Problems in Theology and Philosophy. By the Rev. GEORGE JAMIESON, B.D., Minister of the First Charge, Old Machar. London: Simpkin, Marshall & Co., 1885. Pp. xxix., 629.

This work, in nine Chapters (pp. 1-370), on Christian theology is

supplemented by twenty-five Excursuses on special topics, of which some are more distinctively philosophical in character: "On the ground of Human Immortality" (398-404): "The Connexion of Body and Soul" (414-9): "The Psychological Problem" (483-524): "The Problem of Free-will in Man" (526-35): "The Processes of Mind" (545-56). The author contends for a knowledge of Substance beyond phenomena—thus at p. 501: "There is a substance at the foundation of all being which deserves the name of *spirit;* and to see what is the connexion which subsists between the illimitable substance so denominated and the terminal substance which we call *matter*, I say that the former, as primitive substance, has *energy* and *generic quality* as its inherent attributes; and that matter is in its proper foundations a specific quality thereof, originated in the form of atoms. . . . All this however has respect to but one fundamental side of spirit. This fundamental side, which I refer to as Ether, presents only the objective basis of primitive substance, which yields what we call matter. There is obviously a subjective or crowning basis of primitive substance, through which alone we can account for the phenomena of *mind*."

(1) *Energy, Efficient and Final Cause.* (2) *Development; What it can do and what it cannot do.* (3) *A Criticism of the Critical Philosophy.* (4) *Herbert Spencer's Philosophy as culminated in his Ethics.* ("Philosophic Series," II., III., VII., VIII.) By JAMES M'COSH, D.D., &c., President of Princeton College. Edinburgh: T. & T. Clark, 1884. Pp. 55, 50, 60, 71.

In the first of these pieces (continuing the Series begun by the earlier piece noticed in MIND XXXVII., 143) "an attempt is made to clear up the subject of Causation, which has become considerably confused". "David Hume, in establishing his philosophical scepticism, laboured with all his might to loosen the causal connexion." Dr. M'Cosh's attempt to reverse the process consists in arguments to show that we have a "primitive cognition" of power in causes, both material and mental, to produce their appropriate effects. Five sections deal successively with "Physical Causation," "Psychical Causation," "Causation Subjective," "Various Sorts of Causes," and "Final Causes". The author treats the theory of conservation of energy at some length, seeking not only to explain it but also to "keep it within its proper limits".

In the second piece the question is put, "What is the unity in Development?" The answer given is that development is "organised causation for ends," of which in nature there are two classes: (1) "general ends," such as the harmony that is the result of the uniformity of law; and (2) "special ends," consisting in the good of various kinds of living beings. The great scientific work of the past age has been to show what evolution can do; that of the coming age is to show what it cannot do. It cannot give an account of the origin of things; it cannot explain the nature of the power that works in development; and it cannot of itself give us ends in nature. The appearance of new powers in the ages, of life and mind after matter and of the higher faculties of the mind after the lower, is not explained by evolution. At the same time "it is of no use denying in our day the doctrine of evolution in the name of religion or any other good cause".

The third and fourth pieces belong to the "historical" part of the Series, as the others to the "didactic" part. In the third Dr. M'Cosh expresses the opinion that the principles of Kant's ethics, "if carried into the region of speculative reason, would establish positive truth, without illusions of any kind," while "the phenomenal and illusory principles of

the Kritik of the Pure Reason, if carried out in a Kritik of the Practical Reason, would undermine morality". The proper office of the metaphysician is not, as Kant says, "to purify the *a priori* principles by criticism," but to formulate these principles (or "intuitions" as Dr. M'Cosh would prefer to call them) "without addition or diminution". Kant did not meet Hume's primary position, as he ought to have done, but accepted from him the "phenomenal theory": the consequence of this first error of assuming scattered "impressions" on which the mind must impose its own forms, instead of asserting the self-evidence of the existence of a real self and real things outside, of which we know the primary qualities "directly and immediately," is that Kant's system leads logically to idealism or to agnosticism, as is shown by the development it has undergone at the hands of his followers of different schools. "'Back to Kant,' but back beyond him to what he looked to or should have looked to, and by which his views and ours are to be tested, to the facts of our mental nature."

In criticising Mr. Spencer's philosophy, Dr. M'Cosh finds that "there is one great omission in his enumeration of the original agents from which the actual phenomena of the world are developed. In this process he does not call in mind." Mr. Spencer, he thinks, "is successful in showing that as geological ages have run on there is a constant increase in the general amount of happiness". He has also established another point, "equally if not more important," *viz.*, "that nature prepares for the introduction of morality". The *Data of Ethics*, however, would have been better described as a *Preparatio Ethica;* for although he has shown "that there are aids to human virtue in prearrangements to call it forth and maintain it," Mr. Spencer has "not entered the subject of ethics, which has to look to character and to voluntary acts of human beings". Neither Mr. Spencer's philosophy nor that of Mill, whom also the author "had the courage to oppose when his reputation was at its greatest height," "meets the demands of our intellect or the cravings of our heart".

Hegel's Æsthetics. A Critical Exposition. By JOHN STEINFORT KEDNEY, S.T.D., Professor of Divinity in the Seabury Divinity School, Faribault, Minnesota; Author of *The Beautiful and the Sublime.* ("Griggs's Philosophical Classics.") Chicago: Griggs & Co., 1885. Pp. xviii., 302.

Parts i. and iii. of this volume are a condensed exposition of the corresponding parts of Hegel's *Æsthetik*, accompanied by criticisms, which are kept separate from the expository part of the book by enclosure in square brackets. The second part of the *Æsthetik* having been translated (by W. M. Bryant), the author has substituted for it "an original disquisition, in language approaching nearer the vernacular, and with more immediate regard to present æsthetic problems; yet following also the pathway marked out by Hegel, and giving the substance of his thoughts". The chief aim of this disquisition is to establish the distinction between the "subjective" (or variable) and the "objective" (or invariable) element in the appreciation of works of art; between "the beauty which depends on the attractiveness of a state of things that is transitory" and "that which depends on the ultimate reality, which is permanent". Appreciation of the first kind of beauty is the province of "the lower criticism" which occupies itself with the technical qualities of artistic work and the subjective impression got from it; "the higher criticism" has for its province "whatever in the emotion of the beautiful can only be explained from the ideal of the ultimate perfection, which is the normal and essential constitution of the universe, is the common element in all subjectivity, and thus a part of the true objective". The author goes on to expound the Hegelian

view of the historical development of art: showing how in the first or symbolic period "the spiritual is weighed down by the corporal and material and struggles to be free"; how "in the classic period there is a momentary equilibrium"; while in the third or romantic period "the spirit retires from nature, refuses its allegiance, and returns to it as ideally its master".

Outlines of Metaphysic. Dictated Portions of the Lectures of HERMANN LOTZE. Translated and edited by GEORGE LADD, Professor of Philosophy in Yale College. Boston: Ginn, Heath & Co., 1884. Pp. xii., 166.

Outlines of the Philosophy of Religion, &c., as above. Translation edited, &c., as above, 1885. Pp. viii., 155.

A beginning is here made of translation of the series of eight small volumes of *Grundzüge*, giving the dictated portions of Lotze's courses of lectures, which have been noted in these pages as they appeared in the original during the last three or four years. The series has had a very large sale in Germany, and English readers will, it is hoped, enable Prof. Ladd and his publishers to carry out their thought of adding to the present two volumes, with the *Moral Philosophy* announced to follow before long, at least the *Psychology*, the *Æsthetics* and the *Logic*. No words are needed to commend such an enterprise, now that Lotze's importance as a thinker is so well understood. Prof. Ladd has begun with the *Metaphysic* because of the fundamental importance attached by Lotze himself to this part of his philosophical scheme, following next with the *Philosophy of Religion* for reasons of convenience personal to himself as a teacher. The translation is careful and painstaking, but reads somewhat stiffly. Useful indexes are supplied.

The Elements of Moral Science, theoretical and practical. By NOAH PORTER, D.D., LL.D., President of Yale College. London: Sampson Low, Marston & Co., 1885. Pp. xxv., 574.

The name "Moral Science," because it has "acquired a somewhat profounder signification," is used, rather than "Ethics," to describe the "consistent, articulated and finished system" in which it is here sought "to give the results of careful observations, subtile and exhaustive analyses, clear and careful definitions, verified inductions, logical deductions". "Ethics," according to the author, "more commonly suggests what may be called arranged or classified rules of conduct or behaviour, as given for practical convenience, exclusive of any reference to fundamental principles or scientific grounds". He does not, however, neglect such "Practice of Duty," reserving for it Part ii., after treating in Part i. the "Theory of Duty". The topics of Part i. are—the Sensibilities; the Will; Character; the Intellect, its Functions in the Moral Activities and Experiences; Moral Relations; the Moral Feelings; Ethical Definitions and Theories; Education and Development of the Moral Judgments and Feelings; Social Influences as Helps or Hindrances in Morals; the Law of Honour; the Conscience; Cases of Conscience; the Christian Theory of Morals. Part ii. comprehends Duties to Ourselves; Duties to our Fellow-men; the Doctrine of Rights; Duties of Truth or Veracity; Duties of General Beneficence; Duties to Benefactors, Friends and Enemies; Duties to Family and Kindred; the State; Law and its Enforcement; Duties to the State; Duties to Animals; Duties which respect the Physical World; Duties to God; Special Religious Duties.

The Philosophy of Ralph Cudworth. A Study of the *Intellectual System of the Universe.* By CHARLES E. LOWREY, A.M. New York: Phillips & Hunt; Cincinnati: Cranston & Stowe, 1884. Pp. 212.

The author, who writes from Ann Arbor, Michigan, gives in this "Study," after a few pages on Cudworth's life and works, (1) a sketch of "the Hobbes-Cartesian movement," which Cudworth sought to stem; (2) an account of Cudworth's argument against "Atheism"; (3) a statement of the "characteristics" of Cudworth's philosophy, ending with a view of his theory of knowledge as set out in the posthumous *Immutable Morality*. The design is to work for the rescue of Cudworth from the neglect into which he has been suffered to fall and to induce an examination of the large mass of his unpublished MSS. in the B. Museum. The author has performed his task in a conscientious, if not particularly effective, manner, relying, outside of his author, on the original works of Descartes and Hobbes, and on various historical and critical authorities given in a list at p. 24. The most obvious and serious omission is of Principal Tulloch's *Rational Theology and Christian Philosophy in England in the 17th Century*, in which full justice had already been done to Cudworth, as also to the other Cambridge Platonists (here but slightly touched).

Essais de Critique Philosophique. Par AD. FRANCK, Membre de l'Institut, Professeur au Collège de France. Paris: Hachette, 1885. Pp. xvii., 346.

The doctrine of these Essays is, the author says, a spiritualism not "traditional," but "free and purely philosophical". He protests against the ethical and metaphysical doctrines of the "contemporary English school," which exercises authority "nowhere more than in France". The modern doctrine of evolution, he compares to the ideas of the alchemists; "the dream of the transmutation of metals," he says, "deserves as much indulgence as that of the transmutation of species". This adherence to Cuvier's doctrine of the fixity of species appears especially in the first Essay ("L'Histoire naturelle dans l'Antiquité"), where Aristotle is praised for holding fast to the certainty of the existing distinctions among species, and "leaving hypothesis to his successors," and for his doctrine of final causes. It also influences the critical part of the review of M. Guyau's *Morale anglaise contemporaine* (ix.) and of M. Fouillée's *Critique des Systèmes de Morale contemporains* (xi., "Un Révolutionnaire en Morale"). The historical Essays (the greater part of the book) are, perhaps, of more interest than those that treat of contemporary subjects, both as dealing with matters that are less familiar, and as having been written, for the most part, with no view to their bearing on any particular doctrine of the author. Among them may be selected for special mention "La Philosophie Chrêtienne au troisième Siècle" (a study of Origen), and "Le Mysticisme et l'Alchimie au seizième Siècle" (a study of Cornelius Agrippa). In the first of these, the relations of Origen to Philo and to Clement of Alexandria are pointed out; his influence is traced up to the time of his condemnation; then it is shown how "Origenism" reappeared in a new form "in the heterodox theology and in the mystical philosophy, even in the science of the West"; finally, resemblances are shown to exist between the doctrines of Origen and of modern mystics on whom he has had no direct influence. The object of the study of Cornelius Agrippa is to show that he was not a sceptic like the Pyrrhonists of antiquity, or like Montaigne, for example, as has been supposed in consequence of a false interpretation of the treatise *De Vanitate Scientiarum*, but that he was a critic and a reformer (in religion as well as in science). There was much of the charlatan, the author admits, in Agrippa, but the inconsistencies of his character have prevented justice being done to his work. His notion of "magic" was not essentially different from that of Bacon; it was the idea of a new science of nature. Apart from his scientific ideas and his views of religious reform, Agrippa's system is taken from the Hermetic books and the Cabbala.

La Psychologie allemande contemporaine. (École expérimentale.) Par TH. RIBOT, Directeur de la *Revue Philosophique.* Deuxième Édition, corrigée et augmentée. Paris: F. Alcan, 1885. Pp. xxxiv., 380.

M. Ribot's very serviceable account of present German psychology, originally published in 1879, is not a little altered and added to in this second edition. The net increase of 12 pp. gives no idea of the labour he has bestowed in incorporating with his exposition the main results of the last six years of active work recorded in periodicals like Prof. Wundt's *Philosophische Studien* or set forth in special monographs. Retrenchments at various points render the additions altogether very considerable. The overstrained declaration in favour of the physio-psychological, as against the introspective, method of investigation remains as it was in the Introduction; but in spite of the author's exaggeration at this point, his work in general is much to be commended, and a *good* translation of it would go far to fill a gap that still remains in English psychological literature.

Du Langage et de la Musique. Par S. STRICKER, Professeur à l'Université de Vienne. Traduit de l'Allemand par FRÉDÉRIC SCHWIEDLAND. Paris: F. Alcan, 1885. Pp. 180.

For this French translation of his *Studien über die Sprachvorstellungen* (noticed in MIND XIX. on its appearance) the author has made some additions, of which the most important are c. 22 ("On the Representation of Musical Sounds") and pp. 33-46 of c. 5. This last passage contains a fuller discussion of the researches of Fritsch, Hitzig and Ferrier than was thought necessary in the first edition. In order to meet the opposition of Goltz, Dr. Stricker has repeated many of the experiments of those physiologists, and on the ground of his results maintains the theory of the separation of motor from sensory centres in the cerebrum. He finds that physiological experiments and pathological observations alike confirm the conclusion at which he had arrived psychologically that "pure representations" of words consist of motor and not of sensory images. In the new chapter on musical sounds he contends that the motor element is fundamental in representations of tones as in representations of words. The acoustic element in music corresponds to colour in pictures, the motor element to drawing: and as in the blind the sense of form—which may be appealed to by raised outlines—is detached from that of colour, so in a (comparatively) non-musical person the motor representations become detached (in memory) from acoustic representations; even in the non-musical, however, these last predominate at the time, while musicians also have what they call "abstract" representations of melodies, which are really motor representations. The arguments of Stumpf and Henle against this view are discussed; the author contending that in admitting that melodies can be represented in an "abstract" manner they in effect concede his position. The distinction he had made between movements of articulation properly so called and laryngeal movements is applied to the case of musical sounds; "internal song" is independent of change in the position of the larynx. Dr. Stricker is disposed to believe that the *tensor tympani* plays an important part in the hearing especially of sounds of high pitch.

Le Sommeil et les Rêves considérés principalement dans leurs Rapports avec les Théories de la Certitude et de la Mémoire. Par J. DELBŒUF, Professeur à l'Université de Liège. "Le Principe de la Fixation de la Force." Paris: F. Alcan, 1885. Pp. 262.

After a critical review of the works of other writers on sleep and dreams (Introduction, pp. 1-53), the author discusses the relation of dreams first to the theory of certitude (pp. 55-102) and then to the theory of memory

(pp. 103-253). In dream, as distinguished alike from the waking-state and from reverie, there is absence of any perceptions from which the "conceptions" (*i.e.*, images) that are passing through the mind can be distinguished. Having acquired in waking-life the habit of referring our perceptions to an external object we make a similar reference of our conceptions in dreams; hence the element of illusion. The testimony of others is the only criterion of perception as distinguished from conception, and this is not infallible; there is always room for doubt. "Speculative doubt," a doubt "purely theoretical" applied to things of which we have at bottom no doubt, "is the appanage of a mind in full possession of its reason and is at the same time the sufficient and absolute distinctive sign of reasoned certitude". In laying the foundation of his theory of memory as "the fixation of force," the author discusses at some length the doctrine of the transformation of physical forces. He argues that through the tendency of all forces to equilibrium the "transformability of force" will at length be practically exhausted; the universe must approach indefinitely nearer to a state in which there is uniform distribution of heat and no movement of translation. Organisms fix external force in their substance in the form of a state of equilibrium more or less complete. The cause of sleep is accumulation, not expenditure, of force; for, granted that we expend force in acquiring, say, a piece of knowledge, the effect of this expenditure is to fix in the brain other forces in the shape of ideas. An organism may be regarded as consisting of a "central nucleus" of ancestral and personal habits, and, round this nucleus, of concentric layers on which are impressed as on photographic plates images perceived during each day's existence in the past. In the waking-state there is always a "peripheral layer" which alone remains capable of fixing external forces in the form of memories. When the sensibility of the "periphery" (which need not, of course, be physically the superficies of the organism) is exhausted, sleep arrives; psychically nothing now exists but memories and habits; present impressions have practically disappeared with the exhaustion of sensibility. During sleep the peripheral sensibility is reconstituted. The author contends that nothing that has once been impressed on the sensibility ever disappears. He shows (especially from a dream of his own of which he recorded the details accurately at the time and had to seek for an explanation during a long subsequent period) how some momentary impression that in waking-life appears to have been completely forgotten, may be revived in a dream: hence the importance of sleep and dreams for the theory of memory. Among isolated observations may be mentioned (1) the remark that what appears to be metamorphosis of objects in dreams is often only substitution and not transformation of images; (2) the explanation of the class of dreams in which the solution of a problem insoluble for the dreamer is attributed to another person, as "dramatisation" of the habit of thinking in dialogue; and (3) the attribution of the circumstance that we may "dream we are dreaming" to the habit of making the distinction between dream and reality in waking-life and the persistence of this, as of all habitual modes of thought, in sleep.

La Philosophie ancienne. Histoire générale de ses Systèmes. Par CH. BÉNARD, Ancien Professeur de Philosophie dans les Lycées de Paris et à l'École normale supérieure. Première Partie. Paris: F. Alcan, 1885. Pp. cxxviii., 398.

The author's intention in this history of ancient philosophy has been to give a clear view of the philosophical character of each system without going minutely into questions of scholarship; as much biography being given as can contribute to the understanding of the philosophical expo-

sition. In opposition equally to the schools that reject metaphysics altogether and to those that class it with art and religion as distinguished from science, he contends that the scientific character denied to metaphysics is precisely what distinguishes it from art and religion; that truth, in the strictly scientific sense, has been present from the first in philosophical systems; that this element of truth, once brought to light, is independent of the genius of those who created the systems; and that the truth of each system survives and becomes an integral part of human thought. Thus there has been real progress in philosophy as in the positive sciences: and a modern critic and historian of philosophy, unless he is incompetent, occupies a position from which he can pass judgments equally secure with those of historians and critics generally. In two sections that follow the general Introduction (xlix.-cxxviii., "Les Limites et les Antécédents de la Philosophie ancienne," "L'Orient et la Sagesse orientale") M. Bénard shows in what way mythology, poetry, gnomic sentences, &c., influenced ancient philosophy, and, while giving a short sketch of the chief Oriental philosophies, maintains that Greek philosophy was almost entirely self-developed. He denies, indeed, that there is anything that can, in strictness, be called an Oriental philosophy. There are in Egypt and the East no systems marked with an individual character; everything is vague, impersonal, and generally of doubtful authorship. Above all the influence of positive science and the scientific spirit is absent: what is called the philosophy of India, for example, is a means of redemption of the individual soul from evil, and thus is subsidiary to religion; although it contains philosophical elements it is not disinterested enough to be called a philosophy. The present volume only deals with pre-Socratic philosophy, with Socrates and with the founders of "the minor Socratic schools," *i.e.*, all those who were directly inspired by Socrates except Plato; but the plan of the work includes the history of philosophy to the closing of the schools by Justinian. The volume ends with a study of the Sophists (pp. 247-395). Modern criticism, as represented by Grote on the one hand and Hegel on the other, has, the author admits, for the first time explained the part of the Sophists in the movement of Greek thought; but in attempting their rehabilitation he maintains that it has gone too far. The scepticism of the Sophists was necessary in order to effect the transition from the philosophy of the pre-Socratic schools with its search for physical principles to the philosophy of Socrates and his successors with its investigation of human nature; but they themselves, like the ancients generally, were unconscious of this; they were only concerned to teach the art of making the appearance of truth pass for the truth itself which they did not believe to exist. This is the judgment passed on them equally by Xenophon, by Plato and by Aristotle, and accepted by all the centuries up to the present. Whatever may be determined as to their historical function this judgment on their character cannot be reversed.

L'Origine dei Fenomeni psichici e loro Significazione biologica. Di G. Sergi, Prof. di Antropologia nell' Università Romana. ("Biblioteca Scientifica Internazionale.") Milano: Dumolard, 1885. Pp. xxv., 454.

In the present volume the author is more concerned with general principles and less with any special line of research than in his former work *La Teoria fisiologica della Percezione* (noticed in Mind XXV.). He has also in view the practical bearing of his doctrine, its religious and (to some extent) social applications; indeed it is on this that he lays most stress. Psychical functions are to be considered simply as functions of the organism; that is the only scientific way of treating them. Psychology is

that branch of biology which (from its own point of view, however, and not from that of physiology) treats of the "protective" functions of sensation and motion ("æsthokinesis")—the functions of "relation" as distinguished from those of nutrition and reproduction. "Sensibility" is a universal function of organic matter; in its lowest stage it is identical with irritability; it then becomes "unconscious" and afterwards "conscious" sensibility, acquiring its specific character in nervous tissue. Throughout the whole course of evolution mind has for its function "protection in the struggle for existence". Since it is connected with all other functions as the nervous system is connected with all other organs, "mind" must not be isolated from "life". In the earlier chapters of the book (cc. i.-viii., 1-135) this view is set forth in its generality; then the author goes on to consider the psychical functions "in the animal series" (cc. ix.-xi., 137-247) and "in the human races" (cc. xii.-xv., 249-426), supporting his conclusions always by the results of the most recent investigations. "Pleasure and Pain" (c. xvi.) are described as the primitive form of the protective function, and as derivatives of the tendency to self-preservation inherent in all matter. The short concluding chapter (c. xvii.) states briefly the author's doctrine in its application to practice (insisted on throughout): "the protection of man, as individual and as species, alone or collectively, comes only from man," who is to obtain it by scientific knowledge of himself, of society and of nature.

Die Entstehung des Gewissens. Von Dr. PAUL RÉE. Berlin: Duncker (C. Heymons), 1885. Pp. 253.

The author, who has already published an essay on the origin of the moral feelings (see MIND VIII.), now seeks to trace the origin of conscience, which he describes (rather than defines, since "an exact definition" would be more exact than that which men understand by conscience) as consisting in approval or disapproval of feelings and actions classed as moral or immoral. Egoistic and altruistic feelings such as love and hate, pity and malevolence, have always existed in man; but approval and disapproval of these feelings as "good" or "bad" have their origin in assignable causes: and it is by this approval and disapproval that both feelings and actions acquire their specific moral quality; no intensification of the feeling of compassion itself, which Schopenhauer, for example, regards as the essential element in morality, would make it a distinctively moral feeling. By a historical explanation of conscience, the belief in a supernatural cause of phenomena hitherto inexplicable will be driven from its last retreat. The explanation is found in commands imposed by the State and in penalties attached to disobedience. Limits were imposed by the State on the action of individuals for the sake of maintaining peace, which was constantly broken when everyone was allowed to avenge injuries done to himself. Revenge is not, as has been said, a kind of "primitive justice"; words with strictly ethical connotation only arise after the idea of punishment has become associated with actions that are at first felt by those who suffer from them simply as unpleasant and not as "wrong". In the formation of conscience, religious sanctions have added their influence. Men ascribe to the anthropomorphic gods they have created approval and disapproval of actions they have themselves learnt to approve or disapprove. Thus, although laws do not, as the ancients thought, come originally from heaven, they may be said to "return from heaven". The founders of new religions have transformed morality by ascribing their own philanthropic dispositions to the gods and representing their own judgments as of divine origin. The special character of moral judgments ceases to be in any respect enigmatical when

we keep in mind the distinction between the individual and the race. Customary modes of thinking having been impressed by education (in all its forms, social, religious, &c.), their origin is forgotten: hence, that which historically is a "hypothetical imperative" becomes for the individual a "categorical imperative". The sense of justice, the feeling that retribution is due for actions condemned as "bad," is now seen to be a product of customary association. Punishment (and hence even accidental consequences of actions condemned by conscience), through a kind of "optical illusion," is regarded by those who are punished as a necessary consequence of the past, while it is really inflicted with a view to the future advantage either of the person punished or of others. There are three kinds of repentance: (1) strictly "moral" repentance due to the disapproval of conscience; (2) that which springs from the feeling of pity; (3) "egoistic" repentance, or that which springs from fear of consequences. Of these kinds the last is the strongest, the first by far the weakest. Conscience is like a constitutional king: "it reigns, it is almost honoured as a god, but it does not govern"; the egoistic or altruistic disposition that is predominant really governs, as in a parliamentary state the party that happens to have the majority of votes. This being so, the demonstration that the categorical imperative really originates in experiences of utility to the race will have little influence on practice. But in any case it is not to be concealed that a purely theoretical investigation of conscience ends in the conclusion that the feeling of absolute obligation "remains with us, like the hero in the fable, only so long as we ask no questions about its parentage".

Lehrbuch der Psychologie vom Standpunkte des Realismus und nach genetischer Methode. Von Ph. Dr. WILHELM VOLKMANN RITTER VON VOLKMAR, weil. o. ö. Professor der Philosophie an der Universität zu Prag, &c. *Des Grundrisses der Psychologie* Dritte sehr vermehrte Auflage. Zweiter Band. Cöthen: O. Schulze, 1885. Pp. v., 570.

Prof. C. S. Cornelius of Halle, who has had charge of this second edition of the deceased W. Volkmann's great work (*third* edition, if the original smaller *Grundriss* of 1856, out of which the *Lehrbuch* grew by 1875-6, is counted as first), has been able to complete his revision within the time announced upon issue of Vol. i., as mentioned in our notice of that volume (MIND XXXVII., 146). His additions, mainly but not exclusively bibliographical (see, for example, the long Note under § 111, on "Apperception") increase the body of the present volume by 14 pp.; further, the "Catalogue of Works cited," given at the end, now occupies 23 pp., instead of the 10 pp. within which Volkmann had (by omissions) confined it. One feature of the previous edition is fortunately absent—the appalling list of "Misprints" by which it was disfigured. In its now improved form, the *Lehrbuch* is, without exception, the most useful, because most comprehensive, treatise that any psychological student or worker can have by him. Its value, however, is by no means confined to its comprehensive fulness; the author having been no mere compiler, but a powerful systematiser if not also an independent inquirer. We hope, at some later time, to be able to do justice to its merits in these pages.

Katechismus der Geschichte der Philosophie. Von Thales bis zur Gegenwart. Von Lic. Dr. FRIEDR. KIRCHNER, Zweite, vermehrte u. verbesserte Auflage. Leipzig: J. J. Weber, 1884. Pp. viii., 428.

The author of this "Catechism," which has nothing of the catechetical form in it, has been less successful than with his *Catechism of Psychology* noticed in MIND XXXIV., 318. If it was at all possible to give within the compass of so small a handbook a fairly balanced account of such a

large multitude of thinkers, greater and lesser, as the author seems to have determined to include, either for the sake of completeness or in the interest of "Examinanden," it cannot be said that he has given it. He is not satisfactory where he expands, and where he catalogues, in order to contract, he is apt to mislead. The book is too obviously 'made'. In a second "improved" edition, there should not have been left, if given in the first, such curious jottings upon English thinkers as that "Henry Lewes and G. Macvicar (!) are ardent followers of Comte" (p. 418); or that "since Comte . . . England occupies itself, as since Bacon, with empirical, especially psychological studies, John Stuart Mill (1806-73), Herb. Spencer, and Jer. Bentham (!) being most prominent" (p. 421). Perhaps no writer about foreigners can avoid giving some shocks of the kind, but there are degrees.

Philosophischer und naturwissenschaftlicher Monismus. Ein Beitrag zur Seelenfrage. Von Dr. M. L. STERN. Leipzig: Th. Grieben (L. Fernau), 1885. Pp. 348.

In order to make room for philosophy in the special sense, it is necessary at the present time to show that natural science is incompetent to give a general view of the world. Scientific facts and doctrines fluctuate too much for it to be possible to found a philosophy on them: philosophy must, therefore, seek truths independent of all changes in the theories and results of the natural sciences. There are strictly philosophical questions, the solution of which is independent of everything in natural science, although, at the same time, many results of natural science give indications as to the right solution of metaphysical problems (Part i., pp. 15-204, "Metaphysische Vorbegriffe"). The conceptions by means of which we explain the world to ourselves are subjective and do not express the reality of things, but only correspond to it. According to this view, however, knowledge is still possible; for when we have established a distinction in the world of phenomena we know that there is an objective distinction corresponding to it, although we do not know the real nature of that distinction. By investigation of consciousness, we can obtain a result of unconditional validity as regards the nature of the soul (Part ii., pp. 205-260, "Die Seelenfrage"). Analysis of phenomena shows that there must be a real distinction of substance corresponding to the phenomenal distinction between consciousness and matter. Natural science, therefore, may settle all questions that lie within the limits of the natural world, but not go a step beyond. Thus, there can be a scientific monism taking into its view the whole of nature while it excludes consciousness; but monism in the complete philosophical sense is unattainable. The unconditionally valid result of philosophy, as regards the soul, can be brought into harmony with the doctrine of evolution (Part iii., pp. 261-312, "Menschliches und thierisches Bewusstsein") and with the last results of physiology (Part iv., pp. 313-348, "Gehirnentwicklung und Denkfähigkeit"); for however much thought may be dependent on relations of matter in the brain, and whatever reciprocal action of the soul and matter there may be, thought is still not identical with motion or with any other relation of portions of matter to one another.

Prolegomena zu Forschungen über die Einheit des Geisteslebens in Bewusstsein und That der Menschheit. Von RUDOLF EUCKEN, Professor in Jena. Leipzig: Veit, 1885. Pp. 113.

This book, as the title indicates, is only introductory to the author's philosophical system. Here he states his principle and his method, but not his results. According to the principle laid down, a philosophical explanation of things must take the form of an expression of the activity,

both speculative and practical, of the mind as a whole. The method of philosophy is not to be "psychological" but "noölogical". The psychological (or purely historical) method is a necessary preliminary to philosophy, but does not itself answer questions that are properly philosophical; it is content to set forth the actual sequence of phenomena without determining their inner relations. The author recurs to an idea he has already developed in his *Geschichte der philosophischen Terminologie* (noticed in MIND XIII.) and elsewhere, *viz.*, that since the philosophical conceptions that are active at present sum up the results of past thought, a critical study of their history must of itself determine in great part the true direction of modern speculation. What antiquity and the Middle Ages expected from "metaphysics," the modern period expects from "theory of knowledge". Aristotle's metaphysics was not pure ontology, but was in relation to Greek life, and was of value just because it was an expression of actual life. Scholasticism turned the conceptions of Aristotle into a system of pure abstractions; and the danger of philosophy still is that it should be too abstract and out of relation to human life. The modern conception of "theory of knowledge" is to be adopted so far as it makes clear the necessity of a fundamental investigation of mind; but such a fundamental investigation ought not to be exclusively an investigation of "knowledge for itself," but of the activity of the mind as a connected whole. The true aim of philosophy is not to force "the living content of existence" into categories as colourless as possible, but to be an expression of mental activity in its fulness, and thus, without becoming "a characterless eclecticism," to leave room for the different views of the world and directions of activity that proceed from differences of personality.

Wahrheit aus meinem Leben. Von CARL LUDWIG MICHELET. Nebst zwei Lichtbildern und vier Stammtafeln. Berlin: Nicolai'sche Verlags-Buchhandlung (R. Stricker), 1884. Pp. x., 548.

The distinguished Hegelian, who has now passed his eightieth year, gives an account in this volume not only of his personal life and experiences, but of the various movements, philosophical, literary and political, in which he has taken part. His aim has been to give a purely objective view both of himself and of the events of his life, rather than, like Goethe, to describe the effect of his experiences on himself; the intention so far as possible to exclude all mixture of *Dichtung* with *Wahrheit* is indicated in the title. In his effort to be exact the author has been aided by having adopted, from an early period, the habit of committing to paper notes of the more important circumstances of his life. He refrains from passing judgment on himself except in the last chapter, entitled "My Individual Character". Here he describes his life as having consisted in a series of conflicts between himself and his surroundings and between the different sides of his character; yet life, he says, does not end in a conflict but in a reconciliation. And this conflict followed by union of opposites does not take place simply in the mind of the philosopher, but is in the nature of things. It is a universal experience that the world really contradicts itself, and after having come to rest in a mean position falls into new contradictions which have to be again resolved, till at length the highest contradictions are brought into union.

Grundzüge der Metaphysik. Von Dr. KONRAD DIETERICH, o. Professor der Philosophie an der Universität Würzburg. Freiburg i. B. u. Tübingen: J. C. B. Mohr (Paul Siebeck), 1885. Pp. 85.

The author aims at giving the general results of modern philosophical

thought since Kant. His own metaphysical view has been most influenced by the revived monadism of Lotze. "Pure Metaphysic" (Part i.) is divided by him into (1) doctrine of the logical laws according to which we distinguish true being and occurrence from false; (2) doctrine of the forms of intuition in which all objectively valid things and events are represented by us; (3) doctrine of the forms of feeling in which the representations of single things and events are given as real facts. The distinction that runs through this part is that of "being" from events that take place in "real beings". Neither of these kinds of "actuality" can be deduced from the other. For the being of things "the law of inherence," the law that all events are changes in persistent substances, is the fundamental law; for the succession of events, "the law of causation". Absolutely, the real being to which all events are related is one; but from this absolute unity a relative plurality may be deduced. Part ii. ("Applied Metaphysic") is divided into two sections dealing respectively with "Metaphysic of Nature" and "Metaphysic of Spirit". The metaphysic of nature has to determine (1) the simplest elements of the conception of matter, (2) the conception of mechanical connexion, (3) the law of development. Atoms and their motions are not realities outside us, but simple elements of appearances in space and changes of these appearances; yet they present to us an image of the real world. There is a real reciprocal action of "metaphysical atoms" corresponding to the reciprocal action of physical atoms which we represent to ourselves in space. In order to assign its meaning to the idea of an evolution of the whole world, we need a teleological view that shall include both nature and spirit. The problem of "the metaphysic of spirit" is to combine the results of "the empirical sciences of mind" with the results of pure metaphysic. The union of the idea of teleological connexion (combination, as distinguished from modification, of given feelings and presentations by the free activity of the soul) with the idea of mechanical connexion according to the law of cause and effect, forms a reconciliation of the doctrine of freedom of the will with this law. Thus the relation between free development of the soul on the one hand and psychical mechanism on the other is identical with the relation between teleological connexion and mechanical connexion generally.

Die Italienische Philosophie des neunzehnten Jahrhunderts. Von Dr. Karl Werner. Erster Band: "A. Rosmini und seine Schule"; Zweiter Band: "Der Ontologismus als Philosophie des nationalen Gedankens. (Gioberti, Mamiani.)" Wien: G. P. Faesy, 1884-5. Pp. xv., 472; xv., 426.

In these two volumes the author gives an elaborate account of the philosophical systems of Rosmini, Gioberti and Mamiani. The philosophy of this group of writers is described as part of a movement of return of Italian thought to its true basis in Catholicism; the other parts of the general movement being the literary and political movements of the early part of the century. Manzoni, for example, as the author mentions, found in Rosmini's writings, when he became acquainted with them, the philosophical ground of his own artistic activity and of that of the Italian Romantic school. Just as Italian literature became more national in passing from Classicism to Romanticism, so Italian speculative thought became more national in throwing off the influence of the English and French philosophy of the last century and returning to the Catholic philosophy of the Middle Age. The political side of this national movement, the author thinks, injured its intellectual effectiveness. There was a break between the religious and the political consciousness; for the

expression of the national ideal in practical politics became inconsistent with its remaining a Catholic ideal. Thus in place of a common effort towards the reconciliation of scientific knowledge and faith, towards the regenerative transformation of modern thought in the light of the Catholic idea,—an effort which should have acted first of all on the moral nature and left social and political changes to follow,—there is now on the one side a reactionary Thomism and on the other a philosophy inconsistent with Catholicism. "The new Thomism" must give up its purely negative attitude so far as the undeniable acquisitions of modern research (and these not merely in physical science) require, and must make its speculative ideas comprehensive enough to embrace all the results of thought since the Scholastic period: but in the end everything will be found reconcilable with the Catholic idea.

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V. Knauer, *Grundlinien zur Aristotelisch-Thomistischen Psychologie*, Wien, Konegen, pp. 283.

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G. Biedermann, *Philosophie der Geschichte*, Prag, Tempsky; Leipzig, Freitag, pp. xlix., 386.

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G. Gerber, *Die Sprache als Kunst*, 2te Aufl., Bd. ii., Berlin, R. Gaertner (H. Heyfelder), pp. 526.

NOTICE of some of these has to be deferred till next No.

IX.—NOTES AND CORRESPONDENCE.

PROFESSOR SIDGWICK ON "PROGRESSIVE MORALITY".

With the kind permission of the Editor, I purpose to make a few remarks, in reply to Prof. Sidgwick's friendly but acute criticisms, which appeared in the last number of MIND, on my recent work, *Progressive Morality*.

Prof. Sidgwick's first criticism is to the following effect: "I do not myself think that what is here [in my chapter on Sanctions] characterised as the 'higher' religious motive, which operates when 'we simply do good and act righteously, because God, who is the supreme object of our love and the supreme ideal of conduct, is good and righteous'—comes strictly under the head of 'sanctions' as defined by Prof. Fowler: that is, I do not think it is clearly a case of pleasure attracting or pain deterring". My definition of a sanction (*Progressive Morality*, p. 4) is 'any pleasure which attracts to as well as any pain which deters from a given course of action'. Now, to a man of lofty religious sentiment, what pleasure can attract to a given course of conduct more effectively than that which accompanies the reflection that it is in accordance with the nature and will of One who is 'the supreme object of his love and the supreme ideal of conduct,' or, on the other hand, what pain can be more deterrent than that which attends the consciousness of thwarting and displeasing such a Being? I own that I cannot perceive the force of this criticism as I do that of those which follow.

On the next point I only find myself to a slight extent in disagreement with Prof. Sidgwick. With reference to my statement that 'in the main we approve of ourselves for having done what is thought right at the time, even though we may have come to think it wrong,' he admits that "this is true as regards the moral judgments of reflective persons," but thinks that "the emotional satisfaction with which we contemplate a past act, performed under a sense of duty, which we have come to regard as mistaken, is at best a very feeble pleasure". What I have myself said (p. 34) is, 'that the subsequent results of our acts and any change in our estimate of their moral character may considerably modify the feelings with which we look back upon them,' though I maintain that 'still, in the main, it holds good that the approval or disapproval with which we regard our past conduct depends rather upon the opinions of right and wrong which we entertained at the moment of action than those which we have come to entertain since'. It is plain that the difference between Prof. Sidgwick and myself on this point is only one of degree, and that not a very important one.

I am obliged to Prof. Sidgwick for drawing my attention to a passage on p. 139, where I have, by implication, made an exaggerated statement. Having on p. 33 stated that 'human nature, in its normal condition, is so constituted that the remorse felt, when we look back upon a wrong action, far outweighs any pleasure we may have derived from it, I speak, on p. 139, as if it were only where the feelings of self-approbation and self-disapprobation are *very* strong, that a man *always* gains more happiness, in the long run, by following the path of duty and obeying his social impulses than by confining himself to the narrow view which would be dictated by a cool calculation of what is most likely to conduce to his own private good'. The word 'very,' I must acknowledge, has crept into the sentence through carelessness, as is tolerably plain from the fact that it does not occur in the corresponding sentence, which follows immediately upon it. In the 'normally-constituted' mind, then, I do not regard the

feelings of self-approbation and self-disapprobation as being necessarily *very* or exceptionally strong, though I do regard them as being strong. For by a normally-constituted mind I do not mean simply an average mind, but a mind of which the various faculties are recognised as healthily developed and as being in due proportion to one another. It is not necessarily a mind of heroic or exceptional virtue, but a mind representing a 'norma' or exemplar, which, though not always actually followed, admits of being followed by average men. In the case of such a mind I am prepared to reiterate the statement that the pleasures and pains attendant on the feelings of self-approbation and self-disapprobation are 'far more intense and durable than any other pleasures and pains,' though, perhaps, in order to avoid misconception, I ought to have explained, thus early in the book, that, in estimating relative intensity, I include the elements both of quality and quantity. Nor do I regard this statement as inconsistent with the doctrine ascribed, and rightly ascribed, to me by Prof. Sidgwick that 'sacrifice' is an essential characteristic of acts morally approved. It is true that, if a man consciously and deliberately attempts to forecast his subsequent feelings of satisfaction or dissatisfaction, and throws them, as it were, into the scale, he cannot, strictly speaking, be said to sacrifice his 'own good to the greater good of others'. But this, I imagine, is a rare case. Men usually act on much more direct motives than a prospective reference to their own subsequent feelings. Even the best men act, on most occasions, from principles which, indeed, they have learnt to approve, but without any direct regard to the satisfaction they will subsequently experience. And, when they do act on this motive, it seems to me that there is still an element of sacrifice, an element which I have included under that head in my third chapter, namely, the sacrifice of their own lower to their higher good.

The passage which I have quoted from Hume (pp. 40-42) in order to illustrate the analysis of an act of moral approbation was quoted simply and solely for that purpose, and I had no idea that it could be taken (as it has been taken by more than one critic) as committing me to any other parts of Hume's system. I certainly do not agree with the purely subjective 'hypothesis' of Hume, which 'maintains that morality is determined by sentiment,' and 'defines virtue to be whatever mental action or quality gives to a spectator the pleasing sentiment of approbation, and vice the contrary' (*Enquiry concerning the Principles of Morals*, Appendix I.). On the other hand, in reply to Prof. Sidgwick's question, I may say that I do conceive the class to which an action is intellectually referred, before it excites "the appropriate feeling of approbation or disapprobation," as "having *ethical* characteristics—I mean, as being good or bad, right or wrong". I am sorry if my language is at all doubtful upon this point, but it appears to me that the expressions quoted by Prof. Sidgwick himself, such as 'moral judgment' and the like, sufficiently define my position, and that, had it not been for the quotation from Hume which is supposed to imply more than I intended by it, my opinion could not well have been mistaken. And, even within three short pages (p. 45) of that quotation, I find the following passage exactly pertinent to this question, a passage which Prof. Sidgwick must have overlooked: 'When an action has once been pronounced to be right or wrong, morally good or evil, or has been referred to some well-known class of actions whose ethical character is already determined, the emotion of approval or disapproval is excited and follows as a matter of course'.

There is an apparent inconsistency in my account of the logical process of which the moral judgment is the result, as stated in chaps. 3 and 4 respectively, which I am indebted to Prof. Sidgwick for pointing out,

and which I am glad of the opportunity of correcting. In chap. 3, I speak of referring the actions of ourselves or others to some class, or associating them with certain actions of a similar kind, which are familiar to us, and so determining their character, taking as my instances of such classes a lie, a theft, a fraud, &c. In chap. 4, as Prof. Sidgwick points out, I say that, in the process of forming a moral judgment, 'there are two possible sources of error. In the first place, the act of reference or association may be faulty, and the action may not really belong to the class to which we refer or really be like the other actions with which we associate it. . . . But, even if the action be referred to its right [proper] head, there remains the second question whether we are really justified in regarding the class of actions itself as right or wrong'. Should my book reach a second edition, I propose, in order to avoid misconception and the appearance of inconsistency, to substitute for the last sentence the two following: 'But, even if the action be referred to its proper head, there remains (in all those cases where the reference is to classes less generic than the ultimate heads of right and wrong themselves) a second and further question. Are we really justified in affixing the ethical stamp of right or wrong to the class of actions under consideration?' The fact is that the process of reference may be to class within class. Thus: Is this a mis-statement; and is every mis-statement or every mis-statement of this kind a lie; and is a lie, or a lie of this kind, wrong? It is only, I should maintain, when we have referred an action to the ultimate head of right or wrong, or to some well-known class of actions whose ethical character has been already determined by or for us, that the emotion of approval or disapproval is excited. But there may be an unlimited number of references to previous heads, before this point is reached.

As regards the test of conduct, Prof. Sidgwick, while praising the manner in which I trace "the progress of morality as the result of the continued application" of the test which I adopt, demurs to my statement (p. 108) that 'wherever any change of moral conduct takes place, unless it be dictated by blind passion, or mere submission to authority, enforced or voluntary, the change is invariably due to some change of opinion on what constitutes the advantage of the persons whom it affects'. "To take Prof. Fowler's own instance," he says, "I should attribute such a change as that which has brought about the abolition of slavery rather to an increased general concern for the feelings of slaves than to a changed opinion as to what constituted their advantage." Surely, if I may venture to say so, Prof. Sidgwick takes the word 'advantage' in a very narrow sense. What can be more disadvantageous to any class of persons than a state of things which constantly degrades them in their own eyes, preventing or checking the growth of any feeling of self-respect, and, at every turn, suggesting their inferiority and dependence? And what can be a greater 'advantage' to them than to deliver them from such a condition? It has been a growing sympathy, I maintain, combined with a fuller realisation of everything that affects the ill or well being (including the 'feelings') of the inferior sections of society that has been mainly instrumental in bringing about the change in the conduct of the higher sections towards them.

Prof. Sidgwick proceeds to say that he has a difficulty in criticising closely my view of moral progress, since he is unable to conceive with any precision the application of the test which I propose. This incapacity appears to arise from two causes: (1) because I 'frankly acknowledge that there are some pleasures and pains which are incommensurable with one another'; (2) because I 'recognise the fact that our pleasures differ in quality as well as in volume'. As respects the first point, I cannot help thinking that he mistakes my meaning, though, perhaps, I may have

failed to make it as clear as I might have done. I do not mean that every pleasure, say, of the moral or intellectual kind, is incommensurable with every pleasure, say, of the sensual kind, but that a particular pleasure or pain of one kind may, in the case of some men, be so intense that no amount of pleasure or pain of some other kind, or possibly even of the same kind, can be brought into comparison with it. To repeat my own instance, a man who is tormented with the recollection of having committed a great crime, will, as the phrase goes, 'take pleasure in nothing'; while, similarly, a man who is enjoying the retrospect of having done his duty, in some important crisis, will care little for obloquy or even for the infliction of physical suffering. Or, again, a man may be so absorbed in some intellectual occupation, or in spiritual ecstasy, or in the furtherance of some religious or political ideal, or even in the pursuit of his own reputation, that he may become utterly careless of his surroundings and indifferent to physical and even social enjoyments. I need not go further than a very recent example. Can we suppose that any amount of physical enjoyment would have compensated Gordon for the remorse subsequent on a plain dereliction of duty? Prof. Sidgwick challenges me to say "how many grades of incommensurability there are, and what pleasures and pains belong to each grade". I do not think, and have not stated, that the various kinds of pleasures can be definitively arranged in grades, and that these are respectively incommensurable with one another; and all, it seems to me, that my language implies is that there may be individual cases where a pleasure or a pain is so intense or so lasting, or both, that some of our other pleasures and pains sink into insignificance by its side. It is usually, I think, the pleasures and pains attendant on the exercise of our moral, religious, social, æsthetic or intellectual nature which answer to this description, but there are, doubtless, cases, amongst men of a lower type, where the pleasures and pains connected with the love of gain or the love of reputation, or the gratification or frustration of some sensual impulse, may have the same effect. It commonly happens, as a fact, that these "incommensurable" pleasures and pains are characterised by their durability, but, "however limited in duration," I imagine that I can enter into the feelings of those who would prefer such a pleasure "to an indefinitely prolonged pleasurable consciousness" of a feebler and less thrilling kind, "and similarly *mutatis mutandis* of pains". I may observe, however, that the comparison is not always between pleasure and pleasure, or pain and pain, but at least as frequently, if not far more commonly, between pleasure and pain. A man is impelled to the gratification of some desire or to some course of conduct or mode of life, and he feels that, if he does not follow his inclination, all else will be as nothing to him; or, on the other hand, that, if he can not resist some particular temptation or surmount some particular difficulty, his life will become embittered or insipid. And, even where this feeling is not vivid in the prospect, it frequently is so in the retrospect.

I will not enter on the immemorial dispute, whether pleasures differ in kind. So much in a question like this depends on each man's interpretation of his individual consciousness and experience, that argument is usually out of place. I will merely content myself with remarking that I can see no more difficulty in equating differences of quantity and quality in the case of pleasures and pains than in other matters, where we have to deal with differences of quality as well as quantity. In all considerations of this kind, the process must, to a certain extent, be a rough one, but men usually acquire by experience the habit of determining, sufficiently for practical purposes, the extent to which deficiency in one respect may be compensated by superiority in the other.

I am ready to acknowledge, and am indebted to Prof. Sidgwick for leading me to observe, that my meaning on pp. 94-6 might be made clearer by some changes in arrangement and expression. I ought to have drawn the distinction between 'quality' and 'volume' before saying anything about 'incommensurability,' and I ought then to have proceeded to remark that, though, in ordinary cases, we can roughly equate differences of quality and quantity, there occur, from time to time, in the lives of some men, cases in which no amount of pleasure of one kind would compensate for the loss of a particular pleasure of another, or possibly even of the same, kind, or for the pain arising from the frustration or neglect of some overpowering demand of their nature. This occurrence is most conspicuous in great crises of our existence, but the recollections of most men, if I mistake not, will also supply them with instances from the more ordinary experience of life.

Prof. Sidgwick further criticises my test, by asking "Why is it to be assumed that men's common judgments as to the 'high' or 'low' quality of pleasures are less open to the charge of 'prejudice, fancy and caprice' than their common judgments as to the goodness or badness of actions?" I can only answer by saying that our judgments on the goodness or badness of actions ought to be matters of reasoning, implying an ultimate reference to some test or standard, while our judgments on the high or low quality of pleasures are matters of direct experience, implying nothing more than a reference to our own consciousness, past or present. Of course, the distinction between 'high' and 'low' forms of pleasure is not consciously drawn till man has attained a certain amount of moral, social, religious, æsthetic or intellectual cultivation; but, when he has attained to this point of cultivation, and entertains the corresponding feelings and ideas, he has the power of passing an immediate judgment on the relative value of the various pleasures and pains he experiences, and, in spite of what Prof. Sidgwick seems to imply, I think he usually adopts the distinction of 'high' and 'low' or some corresponding one. Now the 'common judgments' of men on matters of direct experience are, I submit, less likely to be open to the charge of 'prejudice, fancy, and caprice' than judgments which, requiring the application of a reasoning process, are formed independently of such a process. And it is judgments of this latter kind, I find on turning to my book, and not the 'common judgments' of men on right and wrong, as Prof. Sidgwick's words would seem to suggest, with which I connect the words 'prejudice, fancy, and caprice'. What I say (p. 87) is—'If there is no rule of right and wrong, then morality must be, to a large extent, a matter of prejudice, fancy, and caprice'. That the 'common judgments' of men 'as to the goodness or badness of actions' are, as a matter of fact, determined by such a rule, applied consciously or unconsciously, accurately or inaccurately, by themselves or others, is a proposition which I have maintained throughout my book.

Prof. Sidgwick represents me accurately in saying that I prefer to call my ultimate standard of morality 'welfare' or 'well-being' rather than happiness, but he brings, I think, into undue prominence one of the reasons,—what I may call the historic reason,—which I assign for doing so. Mid-way between independent and more substantial reasons, I say of the words 'well-being' and 'welfare,'—'corresponding, too, almost exactly with the *εὐδαιμονία* of Aristotle, they have the advantage of venerable historic associations'. But I am hardly so devoted an Aristotelian as to have been largely influenced by this reason, which is plainly somewhat of the nature of an *obiter dictum*. Be this as it may, however, Prof. Sidgwick regards this correspondence a reason for objecting to my test; "since I find," he says, "that Aristotle, in determining the particulars of *εὐδαμονία*,

appeals to just those common moral opinions as to virtue and vice for which a test, in Prof. Fowler's view, is required". If by these words Prof. Sidgwick means that Aristotle accepts these "common moral opinions" without perceiving the necessity of subjecting them to an external test, I cannot agree with his interpretation of the Aristotelian system, and would refer him, amongst other places, to *Ethics*, bk. vi., chs. 5 and 7; *Politics*, bk. i., ch. 2; bk. iii., ch. 12. But I am here evidently touching on matters too remote from my present object to admit of discussion in this place.

As to the 'practical applications of the moral test' in my last chapter, Prof. Sidgwick thinks that they "are, to a great extent, such as ordinary men would admit to be obligatory in any theoretical discussion, however much they may practically neglect them". I entirely agree with this remark; only I think the explanation of the fact that ordinary men practically neglect them, while they theoretically admit their obligation, is that, not being accustomed to apply any external test to their conduct, they do not adequately apprehend the reasons for them, and, therefore, do not realise the importance of observing them in practice. This is the very ground, I think, on which reflective morality is so much better calculated to be of service to men in the conduct of life than what may be called 'intuitional' morality.

The "undue abbreviation" of some of my arguments in this chapter is owing mainly to the conception which I formed of the proper limits of my Essay, but this is obviously a defect which I cannot attempt to remedy in these pages.

I ought not to take leave of Prof. Sidgwick's criticisms without expressing my gratitude to him for the patient attention with which he has followed my arguments and speculations, and, should my Essay ever reach a second edition or be replaced by a larger and more ambitious work, I can foresee the great advantage which I shall derive even from those portions of his review with which I cannot concur. Philosophical criticism, conducted as Prof. Sidgwick conducts it, cannot be otherwise than beneficial to an author.

T. FOWLER.

THE ARISTOTELIAN SOCIETY FOR THE SYSTEMATIC STUDY OF PHILOSOPHY.—The examination of Schopenhauer's *World as Will and Idea*, the special subject of the present Session, has been brought to a close by the discussion of papers on Books iii. and iv., read on March 23, by Mrs. Brooksbank, and on April 27 and May 11, by the Rev. E. P. Scrymgour. Original papers were read, on March 9, by Mr. S. H. Hodgson on "Free-will and Compulsory Determinism"; on April 13, by Miss M. S. Handley on "The Relation of Consciousness to the Organism"; and on June 1, by Mr. E. H. Rhodes on "The Scientific Conception of the Measurement of Time". The papers were in every instance followed by a discussion.

Prof. Höffding, of Copenhagen, on behalf of the Royal Danish Academy of Sciences and Letters, desires space for the following:—

Question de Philosophie. (Prix: la Médaille d'Or de l'Académie).—L'Académie met au concours la question suivante: *Donner un exposé critique des résultats obtenus par la méthode historique dans le domaine de la morale, et développer l'importance de cette méthode pour la philosophie morale en général.* Les mémoires peuvent être écrits en latin, en français, en anglais, en allemand, en suédois et en danois. Ils ne doivent pas porter le nom de l'auteur, mais une devise, et être accompagnés d'un billet cacheté muni de la même devise, et renfermant le nom, la profession et l'adresse de

l'auteur. Les membres de l'Académie qui demeurent en Danemark ne prennent point part au concours. Le prix accordé pour une réponse satisfaisante à l'une des questions proposées, lorsqu'aucun autre n'est indiqué, est la médaille d'or de l'Académie, d'une valeur de 320 couronnes. Les mémoires devront être adressés avant la fin d'octobre 1886, au secrétaire de l'Académie, M. H. G. Zeuthen, professeur à l'université de Copenhague. Les prix seront publiés en février 1887, et les auteurs pourront ensuite retirer leurs mémoires.

Count Terenzio Mamiani della Rovere, the veteran editor of the *Filosofia della Scuole Italiane* and one of the most indefatigable thinkers and workers of his time, died, at the age of 85, on the 21st of May. Account was given of his philosophical and practical activity in MIND XII., 521 ff.; he is succeeded in the conduct of the Review he established fifteen years ago, by Prof. L. Ferri. The *Rivista di Filosofia Scientifica*, now in its fourth year, has also lost its working editor in Gabriele Buccola of the University of Turin, who died on the 5th of March. Buccola, whose excellent work *La Legge del Tempo nei Fenomeni del Pensiero* was noticed in MIND XXXI., 460, has been struck down when he had only completed his 30th year, but not before he had given proof of no common scientific ability. The latest No. of the *Riv. di Fil. Scient.* (iv. 4) gives the full list of his psychological memoirs produced within the last seven years, and it is a very remarkable one. Francesco Fiorentino, the Hegelian professor at Pisa, has also lately passed away.

Mr. Joseph Brough, of Cambridge University, has been appointed Professor of Logic and Philosophy in the University College of Wales, Aberystwith.

THE JOURNAL OF SPECULATIVE PHILOSOPHY.—Vol. XVIII., No. 3. E. H. Rhodes—A View of the Philosophy of Descartes. W. M. Salter—A Popular Statement of Idealism (i.). T. B. Veblen—Kant's *Critique of Judgment*. Hegel—Introduction to the Philosophy of Religion (trans.). S. W. Dyde—Bradley's *Principles of Logic* (i.) . . . C. B. Pallen—Rosmini's Innate Idea, *A priori* Ideas, and Subject-Object Ideas. Note (Rosmini's *Sketch of Modern Philosophies*). No. 4. L. Noiré—The Problem of Anthropology (trans.). G. S. Fullerton—The Argument from Experience against Idealism. P. Spence—A New Theory of General Ideas. W. M. Salter—A Popular Statement of Idealism (ii.). S. W. Dyde—*Bradley's Principles of Logic* (ii.) . . . .

REVUE PHILOSOPHIQUE.—An. X., No. 4. M. Guyau—L'évolution de l'idée de temps dans la conscience. A. Binet et Ch. Féré—La polarisation psychique. Sikorski—Le développement psychique de l'enfant : ii. L'intelligence. Rev. générale (M. Vernes—Histoire et philosophie religieuses). Analyses et Comptes-rendus (T. Fowler, *Progressive Morality;* R. G. Hazard, *Man as a Creative First Cause*, &c.). Rev. des Périod. Nécrologie (G. Buccola, F. Fiorentino). No. 5. J. Lachelier—Psychologie et métaphysique. V. Brochard—Pyrrhon et le Scepticisme primitif. Sikorski—Le développement, &c. : iii. La volonté. Notes et Discussions (F. Paulhan, G. Tarde, Philonoüs—Un problème de métaphysique : Les difficultés de l'idealisme). Analyses, &c. Rev. des Périod. Société de Psychologie Physiologique de Paris. No. 6. G. Tarde—Le type criminel. L. Arréat—La philosophie de la rédemption d'après un pessimiste. F. Paulhan—Sur l'émotion esthétique. Analyses, &c. Notices bibliographiques (J. N. Keynes, *Studies and Exercises in Formal Logic;* J. M'Cosh, *A Criticism of the Critical Philosophy*, &c.). Soc. de Psych. Physiol.

LA CRITIQUE PHILOSOPHIQUE (Nouvelle Série).—An. I., No. 3. C. Renouvier—Des différents emplois du terme "substance". L. Dauriac—La psychologie de l'artiste. F. Pillon—La formation des idées abstraites et générales (suite). C. Renouvier—La critique littéraire de la *Critique de la Raison pure* (suite et fin). . . . No. 4. C. Renouvier—Examen des *Premiers Principes* de Herbert Spencer. Ch. Secrétan—Une théorie de la connaissance. . . . F. Pillon—Une étude sur les notions d'espace et de temps. F. Paulhan—La réalité des rapports. C. Renouvier—Note sur le baccalauréat. . . . No. 5. C. Renouvier—Les rites sacrés des Brahmanes. . . . G. Noel—Qu'est-ce que la ressemblance? . . .

LA FILOSOFIA DELLE SCUOLE ITALIANE.—Vol. XXXI., Disp. 1. P. D'Ercole—Kuno Fischer e il manoscritto inedito di Kant. L. Ferri—L'idea dellà personalità nella psicologia moderna. D. Cortesi—Ars Nova. T. Mamiani—Della pena capitale. Bibliografia, &c. Disp. 2. L. Pietrobono—Il fondamento psichicho della vita animale secondo il Rosmini e il Darwin. A. Macchia—Alessandro Bain e la libertà del volere. P. D'Ercole—Gli insegnamenti universitari della facoltà teologica. A. Chiappelli—Nuove osservazioni sulle attinenze fra il criticismo kantiano e la psicologia inglese e tedesca. Bibliografia, &c. L. Ferri—Ai nostri associati.

RIVISTA DELLA FILOSOFIA SCIENTIFICA.—Vol. IV., No. 3. G. Cesca—La filosofia scientifica. P. Merlo—Gli studi delle lingue. M. Pompei—La materia considerata come forma d'energia. A. De-Bella—Il diritto e la sua scienza. Note Critiche (B. Battaglia—L'organizzazione economica in rapporto alla genesi della delinquenza. G. Sergi—La filosofia dell' evoluzione nell' Universita Giapponese). Riv. Sint. (F. Puglia—La morale ed il diritto nel naturalismo, i.). Riv. Anal. Riv. Bibliog, &c. No. 4. E. Morselli e. F. Seppilli—Commemorazione di Gabriele Buccola. G. Cesca—La metempirica. M. Pilo—La massa, il moto, lo spazio. L. Luciani—Caratteri logici da seguire nelle indagini sperimentali sulle localizzazioni cerebrali. G. Cattaneo—Idee di Vanini sull' origine ed evoluzione degli organismi. G. Sergi—La psicologia come scienza biologica. Riv. Sint. (F. Puglia—La morale, &c., ii.). Riv. Anal. &c.

PHILOSOPHISCHE MONATSHEFTE.—Bd. XXI., Heft 4, 5. Th. Lipps—Ueber den Raum der Wahrnehmung (i.). J. Borelius—Die Philosophie Boströms u. ihre Selbstauflösung. E. Wille—W. Wundt's irrthümliche Auffassung von Hume's u. Kant's Seelenbegriff. Recensionen. Litteraturbericht (A. C. Fraser, *Selections from Berkeley;* E. Bax, *Kant's Prolegomena*, &c.). Bibliographie, &c. Heft 6, 7. Th. Lipps—Ueber den Raum, &c. (ii., iii.). L. Rabus—Methode u. Methoden: mit Beziehung auf Bd. ii. von Wundt's *Logik*. Recensionen u. Anzeigen. Litteraturbericht. Bibliographie, &c.

VIERTELJAHRSSCHRIFT FÜR WISSENSCHAFTLICHE PHILOSOPHIE.—Bd. IX., Heft 2. K. Lasswitz—Zur Rechtfertigung der kinetischen Atomistik. F. Dahl—Versuch einer Darstellung der psychischen Vorgänge in den Spinnen (ii.). B. Kerry—Ueber G. Cantor's Mannigfaltigkeitsuntersuchungen. C. Abel—Berichtigung. L. Tobler—Erwiderung. Anzeigen. Selbstanzeigen, &c.

PHILOSOPHISCHE STUDIEN.—Bd. II., Heft 4. W. Wundt—Kant's kosmologische Antinomien u. das Problem der Unendlichkeit. L. Lange—Nochmals über das Beharrungsgesetz. M. Mehner—Zur Lehre vom Zeitsinn (i.). W. v. Tchisch—Ueber die Zeitverhältnisse der Apperception einfacher u. zusammengesetzter Vorstellungen untersucht mit Hülfe der Complicationsmethode. J. M. Cattell—Ueber die Zeit der Erkennung u. Benennung der Schriftzeichen, Bildern u. Farben. E. Kraepelin—Nachtrag zu der Arbeit über die Gültigkeit des Weber'schen Gesetzes bei Lichtempfindungen. G. Lorenz—Berichtigungen zu dem Aufsatze über die Methode der richtigen u. falschen Fälle, &c.